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Significance and Interpretation within the Knowledge Based Society

Epistemology and Philosophy of Science, Philosophical Hermeneutics, Economical Theories and Practices

Editors

Teodor Dima **Dan-Gabriel Sîmbotin**

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Preface

The North University of Baia Mare, in partnership with the Romanian Academy, Iaşi Branch, has organized, in Maramureş, a space with a symbolic resonance in Romanian spirituality, the "Significance and Interpretation in Knowledge-Based Society" (27-30th of October 2011) International Conference, as part of the "Knowledge Based Society. Research, Debates, Perspectives" project, POSDRU ID 89/1.5/S/56815. The event addressed both the academic world and the researchers in the humanistic fields, bringing together personalities from 9 European universities and from 15 Romanian universities and research institutes. "Epistemology and Philosophy of Science," "Philosophical Hermeneutics", "Ethics and Social and Political Philosophy", "Psychology and Sciences of Education", "Anthropology and Cultural Studies", "Economical Theories and Practices" are the six sections of the event and these are accompanied by a plenary round table, with the title "Identity and Diversity in the Context of Multiculturalism. Anthropological Theories and Practices".

This volume includes, in revised and developed versions, the papers presented during the "Significance and Interpretation in the Knowledge-Based Society" International Conference in Baia Mare, in the "Epistemology and Philosophy of Science", "Philosophical Hermeneutics" and the "Economical Theories and Practices" sections.

The issues addressed in the papers that make up this collection highlight the importance of epistemology for the dynamics of scientific and cultural life. The fundamental role of significance and interpretation in solving the problems of the knowledge society has been outlined, also.

The interventions in this volume belong to the scholarship recipients of the Project, as well as to contributions of some personalities of great importance in contemporary philosophical (and related) studies, both nationally: Teodor Dima (Iaşi), Virgil Drăghici (Cluj), Ionel Nariţa (Cluj) and internationally: Rahman Shahid and Jeffrey Andrew Barash (France).

The significant coordinates of volume I, “Significance and Interpretation” reveal originality and depth, offering the possibility of dialogue and of solving the specific problems of the society of knowledge.

The Editors

Epistemology and Philosophy of Science

Communication Reflecting Upon Itself. Models in the Philosophy of Communication

Melinda ACHIM

ABSTRACT: Communication is not just a meditation theme for philosophy. On the contrary, it has become the medium itself or the foundation on which some philosophical doctrines base their determinative structures and universals. Also, being in itself a variety of communication, philosophy is at the same time a critique of communication. This is why the linguistic turn of the early 20th century morphed into a communicational turn at the end of the 20th and the beginning of the 21st. This paper aims at presenting the most important models in the recent philosophy of communication, the development of this branch being yet another argument for the communicational society in which we live.

KEYWORDS: *philosophy of communication, information, reflexive discourse*

Since the beginning until the end of her life, the human being engages in interactions with other human beings, all the while being in social interaction. Interactions of any kind depend on our ability to communicate with others. Without a means of transmission or signaling intentions, we would not be capable of social interaction. Communication is not unlike a “cloud” that winds “push apart and scatter and which floats over nearly all the sciences[1]”.

Imported through the French language, the verb *to communicate* in Romanian has a “good brother”, which entitles us to speak of the existence of an etymological double. With the transformations proper to the transition from Vulgar Latin to proto-Romanian, the Latin word *communicare* was inherited as *a cumineca*, having the meaning to "commune" (in the Christian ritualistic sense)[2].

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[1] Daniel Borgnoux, *Introducere în ştiinţele comunicării,* Editura Polirom, Iaşi, 2000, p. 17.

The meaning is there in late Latin, as well, which gave birth to *excommunicare*, meaning "to withhold from the Communion" – which meant the exclusion from the religious community. Here's how for us, Romanians, the original meaning of communication is both profane and sacred: communication is the basis of social organization, mediating "horizontal" relations of people but engaging their "vertical" aspirations, also, in a move upward to higher planes of existence. When required to define communication, most speakers are thinking of "to acquaint", "to let one know" or "to inform".

When one talks about communication an interesting phenomenon is observed: the term *communication* presents itself as conceptual clusters with multiple meanings, being seen as an integral part and, at the same time, comprising procedures belonging to several sciences. In this way, the scholars in communication face a generous field of possibilities, but difficult to detect by a global approach.

Each area of knowledge has its definition or definitions, which emphasize sharing, contact, transfer, energy and information. Every aspect of communication is useful by means of its analysis from the perspective of the field that produced that aspect. Communication can receive emphases of linguistic, psychological, psycho-social, philosophical, mathematical and pedagogical definitions.

For a biologist like Edward O. Wilson, "communication is an action of an organism or a cell that alters probable patterns of behavior of another body or other cell, in a manner adaptive to one or both parties[3]".

In psychology and sociology, communication appears as a process by which an individual, the communicator, transmits stimuli, usually verbal ones, in order to change the behavior of other individuals who represent the audience.

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[2] Mihai Dinu, *Comunicarea – repere fundamentale*, Editura Algos, Bucureşti, 2000, p. 12.

[3] Edward O. Wilson, *Sociobiologia*, Editura Trei, Bucureşti, 2003, p. 24.

“Communication is a social process with symbolic connotations and also a social function that organizes a set of rules and relationships, based on the transmission of messages and by analyzing the response[4]”. A definition in this respect, takes into account social interaction through the system of symbols and messages.

In religion, communication between the individual and the Divine is dominant in a religious system: “the great religions, Christianity, Islam, the religions of ancient communities, the idea of communication between man and deity through religious rituals: religious ceremonies and prayers is obvious[5]”.

In philosophy, the scope of the concept of communication includes sharing, transmission and analysis of the properties of the plane of existence and the definition of the phenomena; one talks about the concept of information society, of an informational core.

In the information and communication theory, communication is any process by which it “may affect communication support through information, receiving another context. Communication includes not only written or spoken language but also visual arts, music, theater, ballet as well as all human behavior[6]”.

From the perspective of communication theory, communication is “a process in which people share information, ideas and feelings; it is the process by which a part called the transmitter sends information messages to another party, the receiver, who identifies the significance of that information[7]”.

Information can be anything, from a “grimace addressed to a friend, pointing out that you’re bored listening to the teacher, up to a coherent complex of a doctoral thesis, which is the result of many years of research in a detailed report that perhaps no more than a few people have ever read[8]”.

The difficulty of defining communication is given by the diversity of the angles under which it is seen; perception, motivation and personality of communicators affect how a person receives information transmitted by another person.

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[4] J.J.Van Cuilenburg, *Ştiinţa comunicării*, Editura Humanitas, Bucureşti, 2004, p. 54.

[5] Ilie Pîrvu, *Filosofia comunicării*, Editura Comunicare.ro, Bucureşti, 2000, p. 11.

[6] Mihai Dinu, *Comunicarea: repere fundamentale*, Editura Algos, Bucureşti, 2000, p. 24.

[7] Lucien Sfez, *Comunicarea*, Editura Institutul European, Iaşi, 2002, p. 18.

[8] Nicki Stanton, *Comunicarea*, Societatea Ştiinţă şi Tehnică, Bucureşti, 1995, p. 23.

Through communication "opinions, suggestions, ideas and predictions are transmitted; when it comes to communication, we consider a useful inventory, which includes all aspects of communication: oral communication, written communication, the listening and the reading process, thus a number of methods, means and modes of communication are being activated, information channels, networks and information flows[9]".

Each definition of communication focuses on one aspect or component: symbols, speech, language, understanding, receiving messages, exchange of ideas and reducing uncertainty – information is sought in order to adapt to reality;

A relatively new field of knowledge, communication, is a somewhat ambiguous situation: on the one hand it has a recognition and support from social and political bodies, and on the other hand, it does not acquire a solid epistemological foundation.

Bernard Miege believes that the sciences of communication and information are part of the "recently appeared" fields, whom political and scientific leaders praise their alleged advantages excessively. They approached the future with certainty (but) work without their legitimate members being able to agree on common conceptual basis[10]".

Jean Caune finds common notes found between communication and culture, both being conveyed unconsciously by users; there are only individual experiences and they support the constant change of the components. However, the two should not be confused: "Culture remains associated to the fields of literature and aesthetics, and communication remains about technical supports that make the relationships work which culture builds[11]".

The philosophy of communication has been defined since Greek-Latin antiquity in the form of Plato's dialogues and Aristotle's treaties, in response to the speculative rhetoric of the sophists. Dialogue, the ultimate form of philosophy, underwent hypostases and changes from Plato to Werner Heisenberg.

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[9] Dennis Mcquail, *Comunicarea*, Editura Institutul European, Iaşi, 1999, p. 31.

[10] Bernard Miege, *Gândirea comunicaţională*, Editura Cartea Românească, Bucureşti, 1982, p.12.

[11] Jean Caune, *Cultură şi comunicare*, Editura Cartea Românească, Bucureşti, 2000, p. 21.

Serge Doubrovsky notes that "philosophy has, in contemporary culture, at least an ambiguous statute: the queen who fell from power, is now the poor relative of science, received out of pity at the end of the table. But, it must be that a halo of ancient powers flows around it, since any conception of the world, even those that stem from the positive sciences, eventually come to be proclaimed philosophical[12]".

Communication is not just a matter of meditation for philosophy but rather as Ilie Pârvu highlighted in his work *Filosofia comunicării/The philosophy of communication*, it became "the environment itself from which some philosophers derive their determinative structures, the universals[13]".

Moreover, being itself a means of communication, philosophy is at the same time a "critique of communication[14]", also, therefore the area of contemporary philosophy. The main orientations or schools of thought are fundamental perspectives on communication: analytical philosophy, pragmatism and phenomenology.

Analytical philosophy, from its leading representatives, Bertrand Russell, Ludwig Wittgenstein, Rudolf Carnap, Donald Davidson and Michael Dummett, is characterized by centering the interest on language, the natural language as a medium of interpersonal communication and the formal languages as representations of our knowledge structure.

Ludwig Wittgenstein, through two fundamental works, *Tractatus Logico-Philosophicus* and *Philosophical Investigations*, led two internal directions of analytical philosophy, the first centered on logical language and the second on natural language. "All philosophy is a critique of language[15]". This is Wittgenstein's statement and it may be considered a maxim defining analytic philosophy. The basic idea of the Tractatus', that any sentence or representation that structure projects through its form, the metaphysical structure of the world, is now recognized as erroneous. The appearance of harmony between language and reality is just a shadow cast upon the world by grammar. Issues concerning the intentionality language and of thought should not be resolved by reference to the relations between world and word, but by the intergrammatical clarification of the internal connections of language.

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[12] Serge Doubrovsky, *De ce o nouă critică?*, Editura Univers, Bucureşti, 1977, p. 12.

[13] Ilie Pârvu, *op. cit.*, p. 15.

[14] *Ibidem*.

[15] Ludwig Wittgenstein, *Tractatus logico-philosophicus*, Editura Humanitas, Bucureşti, 2001, p. 15.

A philosophical approach in communication theory of great significance is the one brought by American philosopher Charles Saunders Peirce. His research led to a new science – semiotics – which showed, based on the analysis of signs, that the general structure and the structure of our experience is our experience of objects, as well. In other words, Peirce wanted to semiotically transform the supreme principle of critical philosophy, invoked to demonstrate the validity of Kant's categories, by replacing the principle of the unity of thought with that of the consistency of signs: "The spirit is a sign that develops through the laws of inference[16]".

Pierce's semiotics intended, from the start, to be a "general theory of the whole philosophy and science established by analyzing the grounds of communication. Communication becomes the source, and the ground of the highest philosophical reflections are designed to lead simultaneously in order to elucidate the semiotic moment of communication[17]".

"A sign is something that stands for something in some respect or quality for an interpretant[18]". In other words, the sign is something that stands for something else and is understood by someone that has meaning to someone, thus the relationship triad: objects – signs – interpretant.

Jurgen Habermas gave his communicative competence a sociological orientation, putting communication into historical-cultural context. He believes that it is necessary to admit a comprehensive path in the approach to data, along with observation: "the paradigm is not observation anymore, but interrogation, that is, a communication in which the one who understands, as the always controllable parts of its subjectivity, must be included to be able to meet the opposite in terms of the intersubjectivity of possible understanding[19]".

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[16] Charles Saunders Peirce, *Semnificație și acțiune*, Editura Humanitas, București, 1990, p. 54.

[17] Oehler, Klaus, *Compendiu al semioticii lui Peirce*, în *Semnificație și comunicare în lumea contemporană*, Solomon Marcus (coord.), Editura Politică, București, 1985, p. 71.

[18] *Idem.*, p. 61.

[19] Andrei Marga, "Prefață" la Jurgen Habermas, *Cunoaștere și comunicare*, Editura Politică, București, 1983, p. 20.

There is a dependence of communication on the social system, which makes its research indispensable and, thus, a theory of the social system, as Habermas observed. Understanding, which is the immanent telos of communication, depends on the rules of interaction between those who communicate; it is not reduced as communication theories that cover a news transmission model, but also extends the agreement which involves communicating the norm of their interactions. Understanding occurs when "an agreement is achieved between members of a linguistic community on the fairness of expression, relative to a common recognized legal foundation[20]".

Other scholars, such as Karl Otto Appeal and Francois Jacques explored the metaphysical virtues of the concept of communicational competence, building it as the basis of a new type of a priori, "the communicational apriori[21]".

In this way, in Habermas's and Apel's communication community there is no significant correlation between the socio-normative and pragmatic dimension of language. This is why Jacques Francois proposes a more operational concept – communicational competence – which leads to the occurrence of reciprocity, mutuality and the participation of communication. They characterize the possibility of communication, correct communication which can translate into a real, true human meaning and reference. Dialogue is, according to Jacques, a constituent practice, which establishes new meanings, we draw reference to in our mediated world, where one can meet categorical conditions of meaning and truth.

The third fundamental direction of contemporary philosophy – phenomenology - aims to elucidate possible reasons for communication and analysis based on intentional acts of consciousness that would found the grammar of communication as grammar of communication-participation. The phenolmenology initiated by Edmund Husserl, continued in various directions by Martin Heidegger, Maurice Merleau-Ponty, Jean Paul Sartre and Emmanuel Levinas, focused on Dasein as a human being, as distinct place of Being.

In this study "The idea of phenomenology and other philosophical writings" of the *Husserliana*, Husserl correlated in the analysis of communication the intention of communication with the formation of the interpersonal community: “The essence of verbal communication will be to establish a community of people by mediating acts of speech[22]”.

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[20] *Idem.*, p. 22.

[21] Ilie Pârvu, *op. cit.*, p. 154.

For Husserl it is necessary to explain the communication act itself, in its intentionality. The constitutive condition is in mutual empathy in order to understand the other by substitution. However, a simple manifestation of the interiority and its perception by another is not a communication. Communication should be distinguished from the acts that one does to have an effect on another and that they are mediated by the acts of communication. We must have communication and transmission of an intention through discourse[23].

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[22] Edmund Husserl, *Ideea de fenomenologie şi alte scrieri filosofice*, Editura Grinta, 2002, p. 55.

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Mircea Eliade: Mythical Representation and Conceptual Language

Lucia AFLOROAEI

ABSTRACT: The paper explores the forms of knowledge that Eliade views as distinct yet correlated, namely philosophical, scientific and mythical (perhaps religious) knowledge. Their links are obvious not only within certain traditional societies but also in modern society as well as in the present-day world. By virtue of these views, Eliade is close to the position of exegetes and epistemologists who acknowledge nowadays the constant presence of mythical and religious representations in the body of certain scientific theories. He also observes that myth and religious experience involve considerable cognitive potential, often serving as important sources for philosophical and scientific thought. As regards to the traditional mythical vision, he argues that it entails an ontology that borders on the Platonist one.

KEYWORDS: *mythical representations, conceptual language, philosophical knowledge, archaic ontology, rudimentary metaphysics*

1. If we're one to consider myth – and above all mythical representation – as a mode of knowledge, one ought to distinguish then between other established modes of knowledge, such as the scientific and the philosophical ones. While their differences are important, they do not exclude communication between these modes of knowledge. It is a known fact, indeed, that certain scientific theories, such as the one stating that atoms are elementary particles, derived from old philosophical research (in the above example, from the ancient atomism asserted by Democritus and Epicurus). Moreover, such lines of research originate in their turn in mythical or the religious thought. Ancient atomism, for instance, may be linked to those old myths that claimed that all existing objects are born from the blending of primordial elements (primary powers or elementals, known as *stoicheia* in Greek) or perhaps from the infinitesimal seed, spread in the primeval waters by a divine power.

There are in fact epistemologists, such as Paul K. Feyerabend[1], who argue that mythical representations and images, either of archaic, traditional origin, or novel, modern ones, pervade the entire field of scientific knowledge, given that the human mind continues to exercise its mythical functions. Other interpreters (such as Gaston Bachelard, Gilbert Durand and Gerald Holton) lay the emphasis on the special function of imagination, with certain discussions even tackling the imaginary of science[2]. This brings present-day science closer to certain narratives with a clear religious or mythical dimension.

Yet how can communication between mythical and philosophical thought be possible? The idea that Eliade developed on this issue had already been examined by leading philosophers, such as Carl-Gustav Jung or Ernst Cassirer. It involves the co-presence, in the workings of the human mind, of two forms of thought: symbolic thought and discursive thought[3]. The former operates with symbolic images and representations, the latter with notions or concepts. The former has chiefly an evocative, at times narrative, character, whereas the latter relies on judgments and reasoning. Symbolic thought does not evade the contradictory aspects of the world as it can also express or narrate that which is contradictory in nature, while discursive thought complies with the principles of logical reasoning (i.e. the principles of non-contradiction, of identity, of the excluded middle and of sufficient reason). Symbolic thought evokes emblematic, archetypal images that are able to sustain a belief or a myth, whereas discursive thought must state the assumptions of an idea and the underlying data that supports it.

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[1] Cf. Paul K. Feyerabend, *Against Method: Outline of an Anarchistic Theory of Knowledge*, 1975, first edition in M. Radner & S. Winokur eds., *Analyses of Theories and Methods of Physics and Psychology*, University of Minnesota Press, Minneapolis, 1970.

[2] Cf. Gilbert Durand, *Aventurile imaginii. Imaginația simbolică. Imaginarul*, Romanian edition of *L'Imagination symbolique* and *L'Imaginaire. Essai sur la science et la philosophie de l'image* translated by M. Constantinescu and A. Bobocea, Editura Nemira, Bucureşti, 1999, pp. 168 sq. As regards the imaginary of science, prominent figures of their time considered the issue, from Gaston Bachelard (*La psychanalyse du feu*, 1938, *L'eau et les rêves,* 1942, *L'air et les songes*, 1943, *La terre et les rêveries du repos,* 1946, *La terre et les rêveries de la volonté*, 1948) and Georges Canguilhem, to Gerald Holton, Paul K. Feyerabend, Ioan Petru Culianu (*Eros şi magie în Renaştere. 1484* and others.

[3] Cf. Mircea Eliade, *Imagini şi simboluri. Eseu asupra simbolismului magico-religios,* Romanian translation by Alexandra Beldescu, Editura Humanitas, Bucureşti, 1994, pp. 11-26.

Yet such differences, as noted above, do not isolate the two modes of thought from each other. Quite the contrary, they either cause them to be complementary or bring them into an analogous relationship. As a matter of fact, both at the level of discourse and of the narrative on the whole, one can establish a series of interconnections between the mythical and the philosophical vision, which makes it possible, in certain situations, to translate one using the terms of the other. It is what Eliade himself achieves, especially when he explores the importance of the cosmogonic myth.

2. The research carried out by Eliade, dwelling upon the cosmogonic myth, brings into focus at least two flanks of his thought – in his position as historian of religions and as philosopher. Below we shall pause to assess each of them individually.

A key dimension of Eliade's exegesis of the cosmogonic myth concerns the actual methodology used. Essentially, this concerns the mode of researching and interpreting cosmogonic myths. In this respect, Eliade explicitly opts for a morphological and phenomenological approach.

Indeed, in *Ordeal by Labyrinth*[4], Eliade openly acknowledged his manner of embracing the morphological method. „Yes, I accept the «structuralism» of Dumézil, of Propp – and of Goethe. /.../ In short, the kind of structuralism I consider fruitful consists in asking oneself about the essence of a set of phenomena, about the primordial order that is the basis of their meaning. I greatly admire Lévi-Strauss as a writer, I believe he is a remarkable mind, yet, to the extent that his method excludes hermeneutics, I cannot find much use for it. A historian of religions, whatever his opinions – from Marxism to psychologism –, thinks that his first duty, in practice, is to grasp the original

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[4] Mircea Eliade, *Încercarea labirintului*, ed. cit., pp. 122 sq. Eliade explicitly refers to his morphological approach on numerous occasions, for instance in *Aspecte ale mitului*, ed. cit., p. 67 or in *Încercarea labirintului*, pp. 121-122.

meaning of a sacred phenomenon and to interpret its history"[5]. At the outset, he makes certain statements regarding Dumézil's "structuralism". "Georges Dumézil has investigated what he called the Indo-European tripartite conception of society, namely its division into three superposed zones corresponding to three functions: sovereignty, warrior force, economic prosperity. [...] In addition to the importance of his work – and, for the moment, it is the only new and significant contribution to the understanding of Indo-European religions – the example of Dumézil is no less important to the discipline of history of religions. He has shown how to complement a meticulous philological and historical analysis of the texts with insights gained from sociology and philosophy".

In fact, his mistrust of such orientations – structuralism, psychoanalysis, Marxism – stems from his justified belief that they are reductionistic methods, often flawed by a sort of ideological fixation.

As regards the morphological method, we ought to retrieve a range of concepts that are typical of it (yet not necessarily confined to it exclusively). One such concept is *archetype* (with the derived notions of archetypal form, archetypal model, archetypal intuition, archetypal mythical motif, etc.). In the semantic sphere of the concept, one may trace a meaning of Platonist or Neoplatonist extraction. The idea of archetype refers to that which can be truly considered as original. In Eliade's case, the archetype represents an exemplary model, a primordial existential situation. This model does not suggest a unit such as Jung's unconscious psyche, but rather a unit of the human paradigmatic experience.

As we have observed elsewhere, Eliade argues that the cosmogonic myth represents above all an exemplary model. Its value as an exemplary model becomes all the more obvious in the archaic mythologies in which such a myth fulfils a central function. In other mythologies, e.g. the Greek, Hindu or Mesopotamian, this central function of the cosmogonic myth is barely visible or even uncertain. One note Eliade made in his *Journal* of 5 September 1966 is indicative in this respect. According to his diary entry, he had delivered a lecture on myth in Geneva. In the audience, there were many philosophers. Aiming for a clear-cut presentation, Eliade only commented on two cosmogonic myths, an Indonesian and an Australian one, which he viewed as genuinely accomplishing a central function, i.e. as an exemplary model, which precedes, prompts and provides for any other kind of creation, "from the construction of a village or of a house, to the celebration of a marriage or the conception of a child[6]". In other words, any type of creation re-enacts, symbolically at the least, the creation of the world, so that, according to Eliade, "it is always a matter of a new creation of the world".

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[5] *Idem.*, p. 122. As regards the significance of Goethe's research, on the one hand, and of Husserl's, on the other, *cf.* Natale Spineto, *Despre Eliade şi Pettazzoni*, in Cristian Bădiliţă şi Paul Barbăneagră, *Întâlnirea cu sacrul*, ed. cit., pp. 94-95.

We might assume from Eliade's assertions that it is chiefly the myths that relate the "creation of the world" that have an obvious archaic character. Naturally, their archaism is not atemporal or frozen. The data of archaic thought may be situated at different stages, as if at different archaic ages.

Eliade explores this issue, more specifically the transition from the original creation of the world (by the creator God) to the other series of creations, in another note in his *Journal* (17 August 1966). "I should show in my Geneva lecture the importance of the creation of the world in archaic mythical thought. God creates the world – but afterward the world is formed, changed, actually "created", several times and not by creator god. Every origin myth (the origin of death or of sexuality, or of the family or of initiation, etc.) is connected with the creation of our own mode of being but also with the way of being of all institutions (family, clan, etc.). A first conclusion: the supreme are not the only important ones for the understanding of a religion; they only open the way for a series of later creations and foundings. That puts the myth of the withdrawal of the creator god and his transformation into a *deus otiosus* into a different light. The god becomes *otiosus* when his example is generalized, that is, when the cosmos and man are re-created or modified *continually*[7]".

Aware that the conference attendees would include numerous philosophers "by vocation or profession", Eliade pondered whether they would be interested in the data of a cosmogonic scenario. As he acknowledges, he avoided translating "into their language the lesson of archaic cosmogonic myths". Nevertheless, in the same entry in his *Journal* of 5 September 1966,

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[6] Mircea Eliade, *Jurnal*, volume I (1941-1969), edition supervised by Mircea Handoca, Editura Humanitas, Bucureşti, 1963, pp. 566-567.

[7] *Idem.*, pp. 565-566.

Eliade provides the following translation for his own use: "It is a matter, naturally, of ontophany, for cosmogony means this: *Being which comes into being*. The birth, the creation of the world is, above all, the appearance of Being, ontophany. That is why the cosmogonic myth is an exemplary type for all types of *creation*, from the construction of a village or of a house, to the celebration of a marriage or the conception of a child. It is always a matter of a new creation of the world, that is of a new epiphany of Being. It is a matter, obviously, of a 'primitive' ontology, of rudimentary metaphysics, if you will – because it reveals the world as an exemplary model of all forms of "reality". But I suppose that such an ontology should interest philosophers – if only because it supports and justifies a number of archaic civilisations[8]".

Therefore, "the creation of the world" is interpreted at this point as ontophany, emergence or manifestation of the Being. According to Eliade, it is all a matter of "the Being which comes into being". Later in his diary, he would use instead of "ontophany" the term "epiphany", i.e. a new creation of the world which means "a new epiphany of Being". As we can see, in the language of ontology, the original creation means the epiphany of Being. By translating the language of cosmogony in this manner, Eliade is justified in claiming that every cosmogony represents a "primitive' ontology". Or, in other terms, every cosmogony may be seen as a metaphysics, albeit a rudimentary one.

Along these lines, Eliade cites as a further argument the fact that the cosmogonic myth "reveals the world as an exemplary model of all forms of reality[9]". From this last assertion, it results that the "world", which is created through a divine or originating act, represents in effect a model. This "world", in its function as a model, must not be confused with the temporal and diverse world in which people are situated at any given moment. On the contrary, it is a model for reality as such. In other words, any other thing becomes genuinely real if it re-enacts, on a different scale and according to its nature, the way the world was created at the dawn of time, *in illo tempore*. For an object to become real, it passes from potentiality to actuality, according to Aristotelian metaphysics. If it is a man-made object, its making is an ordinary form of creation. On both cases, something becomes real, in that it acquires a form of reality, following the pattern exposed *in illo tempore* by the creation of the world itself.

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[8] *Idem.*, pp. 566-567.

[9] *Idem.*, p. 567.

For this reason, Eliade would argue that "the cosmogonic myth is an exemplary type for all types of *creation*, from the construction of a village or of a house, to the celebration of a marriage or the conception of a child[10]". And obviously, the cosmogonic myth serves as a model for any other myth pertaining to the creation of a real thing.

3. In another work, *Aspects of myth*, Eliade highlights with even greater clarity the link between the mythological vision and that which has been called ontology in modern thought.

In fact, every cosmogony brings into focus an ontology (which at one particular point he designates as "archaic ontology")[11]. According to Eliade, "for *homo religiosus* real, authentic existence begins at the moment when this primordial history is communicated to him, and he accepts its consequences[12]". The key terms of an ontology (reality, existence, essence, etc.) can be recognised in the data of any cosmogony, in figurative or symbolic manner. It is understood that the decisive or essential data differ from one cosmogonic scenario to another. "While it is true that the essential events occurred *ab origine*, these events are not the same for all religions. "The essential" is, for Judeo-Christianity, the drama in the paradise, which laid the foundations of the current human "condition". For the Mesopotamians, the "essential" is the formation of the World from the dismembered body of the sea monster Tiamat and the creation of man from the blood of the demon King mixed with a substance derived from the body of Tiamat. For an Australian the "essential" is nothing more than a series of acts performed by the Supernatural Beings in the "Dream Time[13]".

The idea is reiterated at another point in the same volume, when dealing with the original myths. Eliade observes that the essential data of human condition can emerge even after the creation of the world. "A kind of mythical time is still involved, but it is no longer the 'first' time, what we may call the 'cosmogonic' time. The 'essential' is no longer bound up with an *ontology* (how the World – the real – came into being) but with a *history*. It is a History at once divine and human, for it is the result of a drama acted out by the Ancestors of men and by Supernatural Beings different in type from the all-powerful, immortal Creator Gods[14]". Therefore, in this last case, ontology makes way for a history that is at once divine and human.

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[10] *Ibidem*.

[11] A valuable volume on archaic ontology was authored by Vasile Tonoiu, *Ontologii arhaice în actualitate*, Editura Ştiinţifică şi Enciclopedică, Bucureşti, 1989.

[12] Mircea Eliade, *Aspecte ale mitului*, Romanian translation by Paul G. Dinopol, preface by Vasile Nicolescu, Editura Univers, Bucureşti, 1978, p. 87.

[13] *Idem.*, p. 88.

It is therefore natural, in conclusion, to explore the condition of those forms of knowledge that Eliade views as distinct yet correlated, namely philosophical, scientific and mythical (or, in some cases, religious) knowledge. Their correlation is evident not only within certain traditional societies, but also in modern society and even in the present-day world. By virtue of these views, Eliade is close to the position of exegetes and epistemologists who acknowledge nowadays the constant presence of mythical and religious representations in the body of certain scientific theories.

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[14] *Idem.*, p. 102.

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The Reconstruction of the Concept of *God* in Neoclassical Theism[1]

Vlad Vasile ANDREICA

ABSTRACT: In neoclassical theism God is perceived as having two poles: an abstract pole and a concrete pole. The abstract pole refers to what is absolute, independent and immutable, while the concrete pole refers to what is relative, dependent and changeless. In what concerns his contingent pole, God is changing alongside with the changes in the world.

KEY WORDS: *God, dipolar theism, surrelativism, omniscience, change*

The process philosophy starts from the general idea that nature is composed of dynamic and creative events. The essential terms for process philosophy are: “event”, “creativity” and “experience”. The term “event” shows that the basic elements of reality are temporal societies composed from a series of other events[2]. Another very important term in neoclassical theism is “becoming”. Process philosophers replaced the classical term of “substance” with a more dynamic one. Other terms correlated to “becoming” are “event” and “relation”. Becoming is considered a common feature of the entire reality, so when God becomes he makes choices and grows through action and interaction[3].

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[2] David Ray Griffin, “Charles Hartshorne’s Postmodern Philosophy”, in *Process Philosophy and Theology*, ed. Robert Kane et al., State University of New York Press, Albany, p. 5.

Hartshorne's dipolar doctrine presents a God which has two poles: an abstract pole and a concrete one. A pole can be understood apart from the other because they form necessary pairs. The abstract pole refers to what is absolute and independent, while the concrete pole refers to what is relative, dependent and changeless. The concrete aspect includes the abstract one and not the other way around (the reference is about the same entity with two aspects). Even though opposite predicates of the same being are attributed, they are attributed in distinct ways. Hence, God is immutable in what concerns his abstract pole and changing in what concerns his relative pole[4].

In Hartshorne's view, the contraries must be interrelated, because nothing real can be described by just one part of the contraries. To avoid contradictions, Hartshorne identifies two aspects in the essence of the same being: an aspect applied to the supreme pole and another one applied to the contingent pole[5].

The concrete part of divinity is related to real events and from those real events; the abstract part is extracted. The concrete part expresses the world which is changing and the abstract part is the final product of abstracting from this reality. God's abstract pole is about the unchanging aspect in God and the concrete pole expresses the relative and changing aspect[6].

Change and growth are characteristics of God's concrete pole but also universal features. Finite beings distinguish themselves of God, not because they change and God doesn't, but because they change and grow in a limited way while the perfect being changes and grows in an unsurpassable way[7].

God's change does not imply a degeneration. But this doesn't mean that there is no suffering in God – through sympathy; he feels the same way with us. God can be conceived as a friend who suffers and understands, while humans can feel the same way one for another but never fully understanding the other[8].

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[3] Douglas Pratt, *Relational Deity*, University Press of America, Lanham, 2002, pp. 37-38.

[4] Santiago Sia, *Religion, Reason and God*, Peter Lang, Frankfurt, 2004, p. 18.

[5] Charles Hartshorne and Wiliam Reese, *Philosophers speak of God*, University of Chicago, Chicago, 1953, pp. 2-4.

[6] Douglas Pratt, *Hartshorne and Maquarrie on God*, Universitty Press of America, Lanham, 2002, pp. 7-8.

[7] Santiago Sia, *Religion*, p. 23.

Against classical theism which described God as having just those attributes that could strengthen the concept of the "perfect being", dipolar theism upholds a God which necessarily includes these contraries: there was just an arbitrary decision to keep just one pole from each pair of contraries[9].

The theory of dipolarity is also used for other essential attributes of the perfect being, such as goodness and power. When we talk about God's abstract forms of these attributes it is true that no one could surpass God in goodness or power. The supreme power refers to the power capable of controlling the universe in the best possible way. But these abstract attributes have to be somehow actualized, in one concrete form or another. How and in what form they will be actualized remains a contingent problem[10].

In *Creative Synthesis and Philosophic Method*, Hartshorne states that "no rule of logic forbids saying that a thing has a property and also its negative, provided the positive and the negative properties are referred to the thing in diverse aspects. The same reality may, in one aspect, be universally open to influence and in another aspect universally closed to influence[11]".

Hartshorne insists that his neoclassical theism is more appropriate to the theists than is classical theism exemplified by Aquinas and many other theists. Hartshorne's doctrine of God proposes to give a better image of God accommodating certain aspects of theistic beliefs, such as divine perfection, freedom and creativity as well as to surpass classical theism's difficulties[12].

In order to overcome the main difficulties of the classical doctrine of God, neoclassical theism suggests a new definition of perfection which:

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[8] Charles Hartshorne, "Interview with Hartshorne", in *God, Process and Persons*, Randall E. Auxier et. al. (ed.), Vanderbilt University Press, Nashvile, 2011, p. 95.

[9] Douglas Pratt, *Hartshorne*, p. 4.

[10] Santiago Sia, *God in process thought,* Martinus Nijholf Publishers, Boston, 1985, pp. 57-58.

[11] Charles Hartshorne, *Creative Synthesis and Philosofic Method*, Open Court, La Salle, 1970, p. 233.

[12] Jay W. Richards, "Charles Hartshorne's Critique of Christian Classical Theism: Separating the Chaff from the Wheat", in *Methaphysics, Analysis and The Gramar of God*, Randy Ramal (ed.), Mohr Siebeck, Tubingen, 2010, pp. 111-112.

1. Strengthens the force of the argument which tries to establish God's necessary existence starting from a logical possibility
2. Gives necessary existence a proper understanding in order to overcome logical difficulties
3. Is free from those mistakes implied in classical theism[13].

The infinity of the divine potentiality might represent the *coincidence with the possibility as such*. To be possible is to be a possible object of divine knowledge. In the case of actuality the same notion of coincidence is necessary: divine actuality is all actualized. God knows the existence of everything that is actual. All the actuality is included in God's actual knowledge, and anything which is possible is included in God's potential knowledge. From this it results that we may define perfection as "modal coincidence"[14].

Tomis Kapitan explains that "modal coincidence" is a notion equivalent with "perfection" because a perfect being knows all the actual events and knows the future events, but only as possibilities[15].

By "modal coincidence" Hartshorne tries to show that God coincides with the whole reality concerning both actuality and potentiality. All actual things must be actual in God and all possible things must represent the potentiality of their constitutive parts[16].

In order to be perfect, God needs to be unsurpassable. Neoclassical theism maintains this idea with the remark that God could surpass himself in future states. This perspective was rejected in classical theism because a God who could grow in perfection was a God which was not perfect in the first place. For neoclassical theism the notion of "absolute perfection" is contradictory because not all values can co-exist. The idea of "all possible values, fully actualized" doesn't make sense because certain values contradict themselves. In this sense, God could not know somebody reading a book in the house and driving his car. If I am reading a book, God knows this and the other possibility is excluded. To say that all possible values are actual in God would mean to empty the actualization on any meaning. Religion tries to show that God is interested in what we do, and he takes care of us. If all possible values would be actualized in God, there would be no sense for someone to try to do good things. Contrary to this view, neoclassical theism considers us in a mutual relationship with the perfect being – the actions of one part are important for the other. But in the case of a perfect being, new values could not mean decay as it is the case for human beings[17].

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[13] Charles Hartshorne, *The Logic of Perfection and Other Essays in Neoclassical Methaphysic*, Open Court Publishing, La Salle, 1962, pp. 33-34.

[14] Charles Hartshorne, *The Logic of Perfection and*, p. 38.

[15] Tomis Kapitan, "Perfection and Modality: Charles Hartshorne's Ontological Proof", in *International Journal for Philosophy of Religion* 7, 1976, p. 382.

[16] Charles Hartshorne, *A Natural Theology of Our Time*, Open Court, La Salle, 1967, p. 20.

Many difficulties arise about the classical conception of perfection. When we speak about the perfection of one entity, we have to say that is more perfect not because we are referring to qualities like love or grace but because it has more experience than another[18].

There are many critiques concerning the neoclassical concept of perfection. One of these critiques comes in the form of a dilemma: God's perfection cannot change into a greater perfection because this would imply that he was an imperfect being from the beginning, and if he changes he would have to be considered a part of the creation and not the supreme being. These critiques failed to understand that God changes but only through his concrete aspect. Under the abstract aspect, God remains the same, no matter what situations may appear. In a sense, God depends on the world, and the world is included in him and in another sense, he is independent and transcends the world. Hartshorne's response to a question like: *Is God independent or not independent of the world*? This would have to be "yes and no", depending on which aspect of God we refer to. God's existence implies the necessity of "there being a world" and just the possibility that there existed exactly this world. As a cause implies an effect; the same God as a creator implies some sort of creation but not a particular creation. In what concerns his abstract pole, God is not essential that our world exists and in his concrete pole God is a part of creation and interacts with the world[19].

The Scholastics agreed with Aristotel in the fact that knowing depends on the known, but they considered that this theory cannot be applied to a perfect being. God has to be in relation with everything if we talk about perfect knowledge[20].

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[17] Santiago Sia, *Religion*, pp. 31-32.

[18] Colin E. Gunton, *Becoming and Being*, SCM Press, London, 2001, p. 16.

[19] Santiago Sia, *Religion*, pp. 21-22.

It is clear for all theists that God has to know past events. The main differences for them refer to future events. Those who sustain that God knows the future, give up on temporality and make everything eternal. If God knows future events, then there is no future for God (these events are as present in God as those from the past). The right perspective, from a neoclassical perspective, is that in which the future events are possibilities which are not yet actualized. The past is always kept in God, but the future has to be "future" even for a perfect being[21].

Being omniscient, God always knows what it is to be known, but his concrete knowledge (knowing a certain object in a certain situation) is dependent of the existence of that object. Knowing, as an actual object that does not exist, would be an error even for God. God's knowledge grows alongside with the content of the knowledge[22].

The future should remain opened even for perfect knowledge: God knows everything that is actual and grows in knowledge alongside all actions in the world. His knowledge is enriched from one moment to another.

If omniscience is understood as the best way of knowing, the concrete form of this knowledge is contingent with the particular thing of which it is cognitively related. God's concrete knowledge cannot be expressed in maximal terms because not all possibilities can be actualized. God's concrete knowledge has to be considered optimal and continuously enriching[23].

God's omniscience is an abstract feature of God – the permanent feature of knowing all the time what is to be known. God's concrete knowledge changes from one moment to another, because new things to be known appear in every moment. Through this perspective, it is possible to explain the knowledge of a changing world and the way in which God's experience can be enriched[24].

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[20] Charles Hartshorne, "Clarke's Thomistic Critique", in *Charles Hartshorne's concept of God*, Santiago Sia (ed.), Kluwer Academic Publishers, Boston, 1990, p. 277.

[21] Charles Hartshorne, "Interview with Hartshorne", in *God, Process and Persons*, Randall E. Auxier et.al. (ed.), Vanderbilt University Press, Nashvile, 2011, p. 96.

[22] Santiago Sia, *Religion*, p. 19.

[23] Santiago Sia, *God*, p. 57.

[24] Griffin, "Charles", p. 20.

Charles Hartshorne considers the divine knowledge as absolute, but not in all respects. It is a mistake to consider human knowledge as relative just because it is inferior. God as a knower, knows absolutely whatever is to be known – but even God is relative to all that is to be known. Omniscience must be considered a mark of God's relatedness. The omniscience in neoclassical theism implies a relationship of adequacy between the knower and the known. This adequacy means that God knows the actual as actual and the potential as potential. Something not fully actualized is something potential, something related to the future. God could not know in advance which of the possibilities will be actualized. The divine knowledge could not fail in knowing all that is to be known, but neither could know something which is not there to be known. The perfect knowledge of creation implies a perfect relatedness between the perfect being and his creatures[25].

God knows every person's feelings and experiences completely. Because God is omniscient a coincidence between love and one's own interests is possible. This coincidence is not possible for other creatures because in us there is always a conflict between self interests and altruism (concern for the good of the others may imply some sacrifice of our own good)[26].

In what concerns God's knowledge of our speech Hartshorne responds that "God must be considered fully aware of our speech and what it means for us. I think God has to be considered fully aware of our speech and what it means for us. I think God has to be considered as language from above. The other animals exhibit a language that is below, and I think God is above it[27]".

In neoclassical theism, God is perceived as being related to the world, and this form of relationship between God and the world is considered to be "sympathetic dependence" – a concept developed by Alfred Whitehead and later by Hartshorne. This sort of dependence implies mutual relations between God and the world: a change in the existential state of one's entity means a sympathetic change in the other. So, when we feel joy or sorrow, God sympathetically feels the same way with us. Being dependent doesn't affect God's existence – becuase God exists, it is not dependent on any existing thing. The dependence is seen as an ontological relatedness. That means that God does not depend on humankind for his existence. The only dependency is one regarding the nature of God's existence. God is dependent on humankind and humankind on God in the sense of a mutual participation. God's independence refers to an abstract pole and expresses the identity which allows God to remain himself through all changes. The independence is included in dependence, and both are marks of a relational God[28].

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[25] Douglas Pratt, *Relational*, pp. 40-42.

[26] David H. Nikkel, *Panentheism in Hartshorne and Tilich*, Peter Lang, New York, 1995, p. 89

[27] Charles Hartshorne, "Interview", p. 89.

Hartshorne has followed Whitehead in considering the reality and human nature as being social. The reality is composed of relations, and these relations are the basis of social structure. If the entire reality is relational and if God includes the whole reality, then relationality is a basic feature of God[29].

In "Man's vision of God", Hartshorne strengthens the idea that without us, God would not be the same as he is. His existence would be generically the same (and this participation is implied with everything that happens in the world), but the details of participation would be different if the things to which God is related were different. Therefore, God's dependence and independence are necessary aspects of the same being[30].

The problem of internal and external relations is a very important issue for neoclassical theism. Even though these relations form a pair of contrasts, they are necessary relations for the same being. The internal relations refer to God in his concrete actuality (God which includes the world with all the things). The external relations refer to God's necessary aspect, and what is necessary could not include anything contingent. Only the contingent aspect is relative while the necessary aspect is abstract, and it does not include the actual world[31].

In neoclassical theism, the being of God has to be understood with respect to both, external and internal relations. There is a relationship in which the humankind is internally related to God and which implies an external relation of God with humankind. On the other side, we have a relation between God and humankind which is internal for God and external for the humankind. This view allows us to perceive God and humankind in both internal and external relations, even though in different ways[32].

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[28] Douglas Pratt, *Relational*, pp. 20-22.

[29] *Idem.*, p. 29.

[30] Charles Hartshorne, *Man Vision of God*, Archon Books, Connecticut, 1964, p. 282.

[31] Charles Hartshorne, *A Natural*, pp. 26-27.

The neoclassical concept of God implies a being which sustains, and it is involved in relations. Personhood is a relational construct because the personality of an individual is constituted out of a system of relations. God is also an instance of this rule – he is considered to be the supreme personality[33]. To be relative is to take other things in consideration, to allow them to make a difference. God has to be related to humankind – he has to represent the supreme case of relativity[34].

God knows every person's feelings and experiences completely. Because God is omniscient a coincidence between love and one's own interests is possible. This coincidence is not possible for other creatures because in us there is always a conflict between self interests and altruism (concern for the good of the others may imply some sacrifice of our own good)[35].

The unsurpassable could not be without love because in that situation humankind would surpass God. To love someone else means to co-participate with others in joy and sorrow, to be influenced by others[36]. In Philosophy and Ortodoxy Hartshorne sustains: "If God is not better satisfied by our good than by our evil acts, and less satisfied by the acts we do perform than he would have been by those better ones we might have achieved, then it is simply meaningless to say that he loves us, as well as the problem of what the value and purpose of our existence is without religious answer[37]".

There are philosophers, like Norris Clarke, who attack Hartshorne for his rejection of the creation *ex nihilo*. In Hartshorne's system, there are always previous entities which after death become partial causes, along Gog, for the actual entities. In this situation, God is not the only cause for the contingent being's power and existence. The question is where can we find in this infinite series sufficient reason for our existence and for our real power? None of these past entities could be a sufficient reason because it depends on something from the past and so on. Each member of this series has a conditional existence, because it depends on the existence of someone in the past and so on to infinity. The most important reason for Hartshorne's rejection of the creation *ex nihilo* (and considering God the ultimate source for power and existence) is represented by his critique to the classical concept of omniscience. The creation *ex nihilo* would strengthen this important attribute of the perfect being[38].

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[32] Douglas Pratt, *Relationa*, pp. 23-24.

[33] Douglas Pratt, *Relational*, p. 32.

[34] Charles Hartshorne, *Creative*, p. 55.

[35] Nikkel, *Panentheism*, p. 89.

[36] Charles Hartshorne, *A Natural*, p. 75.

[37] Charles Hartshorne, "Philosophy and Ortodoxy", in *Religion, Reason and God* Santiago Sia, Peter Lang, Frankfurt, 2004, pp. 16-17.

The distinction between concrete actuality and abstract existence is a key point in Hartshorne's dipolar doctrine. When we refer to the concrete actuality, we refer to a permanently changing person. If we exclude all changes (the personal and social part of a person) there remains just the abstract that this person exists. God is changeless and in relation with all other beings, but he is also immutable and absolute regarding his abstract aspect[39].

The existence of a perfect being cannot be contingent – it must be a positive or negative necessity. If the necessary existence is logically possible and if perfection is also possible then the ontological argument is a valid demonstration for theism[40].

Hartshorne denies the doctrine of immortality of the soul (he denies that the soul continues to exist apart from the body), but he does not deny what Witehead has called *objective immortality* – this is a part of God's omniscience, and He remembers all that occurred. So, all humans live forever in God's memory[41].

Like many other dichotomies, the one between "essence" and "existence" is too easily approached and by this, it effaces an important distinction. The existence is only a relationship of the exemplification which the actuality has with the essence. "I exist" if the defining features of my personality are, in a way, embedded in the current events, regardless which these might be. Philosophers should pay proper attention to the difference between "existence" – the abstract truth that an abstraction is somehow embodied in a concrete manner and the "actuality" – that *how* of the embodiment. Hartshorne considers that the following truth has been neglected: that actuality cannot be necessary; it must be a real duality in God and only in him between the "necessary existence" and "contingent actuality". The failure to distinguish between essence and actuality had made some philosophers think that they could reject the argument from Proslogion III if they successfully rejected the argument from Proslogion II[42].

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[38] W. Norris Clarke, "Charles Hartshorne's philosophy of God: a tomistic critique", in *Charles Hartshorne's concept of God*, Santiago Sia (ed.), Kluwer Academic Publishers, Boston, 1990, pp. 104-106.

[39] Santiago Sia, *Religion*, p. 33.

[40] Charles Hartshorne, *The Logic*, p. 33.

[41] Donald Wayne Viney, *Charles Hartshorne and the Existence of God*, State University of New York Press, Albany, 1985, p. 42.

The main directions in classical theism are not of much use anymore because of its internal contradictions between God's qualities like omniscience, omnipotence, perfect goodness etc. Neoclassical theism propose a God in which the main difficulties found in classical theism are surpassed, provides a dipolar doctrine of God – a God which is related to the world and whos knowledge is growing alongside every action in the world. The future should remain opened even for perfect knowledge: God knows everything that is actual and grows in knowledge alongside with all actions in the world. His knowledge is enriched from one moment to another. Our knowledge is limited while God's knowledge is complete, because the reality is included in God and in this way God relates to all actions that take place in the world.

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The Languages about Reality and the Limits of the Objective Knowledge

Dan CHIȚOIU[1]

ABSTRACT. This present paper aims to take an analysis of the languages about reality from the perspective of their acceptance of what we call objective knowledge. We have to consider two aspects. First, it is necessary to indicate what characterize a language about reality. It is not a language about being, world, existence, etc., but a language about reality as such. In this current presentation I will identify two situations of this kind, those founded in quantum physics and in hesychasm. In both of them the conscience of a limit of knowledge (considered as objective is explicitly present). Secondly, by objective knowledge I understand that knowledge which involves the qualitative description of reality as it is. I will discuss whether there is a closeness of these two languages from the perspective of this kind of limit, and I will evaluate the consequences of this situation from an epistemic point of view.

KEYWORDS: *reality, objective knowledge, spirituality, language*

We are now in an interval of paradigm rupture, not only regarding the explanation but also regarding the norms by which the rigueur is established. More than that, even the meaning of the rigueur concept is brought to attention because another concept, decisive for the articulation of the modernity discourses (not only of the scientific one, but also of the philosophical discourse and even to a certain extent of the theological one), the concept of *objectivity*, was disputed. Moreover the second half of the century recorded an extraordinary challenge for the discursive canon which started to function in the same time with the appearance of modernity. A greater challenge where science played a decisive role, but philosophy (precisely phenomenology), as well as a neo-patristic discourse (as well as the different kinds of religious existentialism) brought along an important contribution. This science imposed as a decisive term the Reality one; in a similar way the neo-patristic discourse uses the term and even the phenolmenology implies it, even if it makes it rather indirectly. The traditional language of ontology was abandoned, and even the notion of ontology with its signification area became problematic.

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In order to offer an explanation to this very important change in understanding and describing reality, we shall start with a brief evaluation of the explanatory paradigms which dominated the modernity, having in view the difference which they brought towards what the antiquity had established as an explanatory model. Aristotle was especially interested in the formal rules according to which the concepts could be used as well as the consistency of using them; thus it was possible that a language, proper to science, could be articulated. On the other hand Aristotle explained the scientific concepts (and not only) starting from the empirical data obtained by the senses. He noticed that all moving bodies which were not activated by any force would eventually stop; therefore he raised this observation to the level of the fundamental principle of knowledge. As well, he started from the observation that the living beings had all kinds of various shapes with different qualities, and therefore he stated the idea of various fundamental shapes as a reference point of his philosophy. The set up of Aristotelian science implies the presupposition of the existence of a great shape abundance and variety. The Aristotelian concepts prove a special attention for the qualitative descriptions, but the quantitative considerations are much less present. If we have to take this aspect as a sign of the model that articulated Aristotelian science, we can notice that this model remains the reference point of this kind of preoccupation until the modern era, precisely until the 17th century.

The change of paradigm comes in Galilee's time. Beginning with Galilee, the dominant paradigm was that of the concept of *hierarchy*. From this perspective there are fundamental and non fundamental concepts; the latter ones have to be explained in the terms of the former ones, so that eventually the description of the physical world can be entirely described in the terms of a few basic notions connected together by quantitative laws. And as we know, in classical physics, just like in all the other sciences, this conception eventually prevailed.

With all the differences between the Aristotelian perspective and the Cartesian-Galilean one, they have in common the vision according to which the basic concepts (which are not derived) are either the obvious ones or at least, idealisations of the obvious ones: there are the familiar notions, "clear and distinct ideas", as Descartes stated – whose unquestionable validity is fully guaranteed by common sense (e.g. by God). It has often been mentioned that Galilee, Descartes and Newton brought mathematics into physics. But it has been omitted that they used mathematics first of all in order to give *a quantitative content* to the objects designated by familiar concepts (with the validity guaranteed by common sense). On the other hand, the involvement of mathematics into physics shall modify the understanding of the manner to describe the world: to know means to eliminate the sensible, the concrete in favour of the description only of the characteristics considered essential of an object, only those characteristics which are describable from a mathematical point of view[2]. From a strict point of view of the possibilities offered by this paradigm for the scientific research, it is an important step forward, but also a step backward. The step forward provides an explanation of the idea of nature as well as the technological exploitation of its properties, properties assessed by means of mathematical instruments. But there is also a straying from the understanding of the alive, from the notification of what is beyond the essential characteristics and the properties of the objects. Even nowadays, in many fields of research, it is possible to describe the data and the processes only according to the familiar concepts, being the most productive way to reach the results. An example is the case of molecular biology where molecules can be described as having rigid shapes and mechanical behaviour. This approach has proven its viability especially by its capacity of making truthful predictions. But there is also a great risk: considering that this paradigm can offer an absolute explanation, that there is nothing left but its possibility to assess (some scientists, not a few, believe that, even now).

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[2] Michel Henry, *I Am the Truth. Toward a Philosophy of Christianity*, trans. Susan Emanuel, Stanford University Press, Stanford, 2003, p. 153.

The vision about a world created by classical science can be called 'multitudinous': the matter which constitutes the world is actually a myriad of simple elements, atoms or particles which are all in a relationship by means of fields. The classical perspective also states that the interaction among elements is made by means of forces which decrease when the distance increases[3]. The presupposition involved in this kind of investigation is that the complete knowledge of the parts realizes the whole, that fundamentally the whole is nothing else but a composition of the parts, a presupposition that best describes the multitudinous perspective. According to the multitudinous method, the number of properties considered intrinsic is limited; they are the so-called primary qualities, and all the other properties which compose the sensitive world are seen as originated in new.

The only acceptable research method from a rational point of view for Antiquity and the Middle Ages consisted in going from universal to particular. The medieval people started by constituting an ontological conception, and then they inferred from it by means of purely logical instruments all the aspects that kept to concrete nature. If this vision can be described as centred on explaining the intrinsic properties of things, then Galilee brings along an objectivity centred idea on the law and less on the phenomenon. The meaning of objectivity in the new paradigm was the identification of the order nature of law, as the fundamental structure of reality. Besides that, Galilee starts his research in a totally different way, unlike the medieval people, considering that an authentic knowledge of „what really is" comes from observation, but provided that some aspects of reality are ignored, considered secondary and somehow illusory. The role of mathematics is not to establish connections between simple notions which are simple products of thinking nor syntheses of our thinking, but which we obtain from our experience and which refer to reality. This vision is constituted in *ontology*, the formulation as such belongs to Descartes. This French philosopher analyses and offers a justification to this type of realism: based on stating the Cogito, he states the ontological argument which proves the existence of an infinite Being incapable of cheating us. Consequently it is stated that anything is true to the extent in which we clearly know that it is true, reaching the statement that the notions of shape, size and movement are true because they are clear. Nevertheless, the validity of this thesis is limited because it is stated that in the field of material things only in connection with something like that can be stated. Unlike Descartes, Galilee will state and involve the movement relativity principle, which shall bear the name of Galilean relativity: this principle shall play an extremely important role in the directioning of the scientific experimentality into the physics of classical paradigm[4].The hard core of Galilean physics is stating a certain meaning of the objectivity: the reality described by classical physics is independent, that is: the measurements do not interfere with the phenomena. This thesis has become *the central thesis* of any kind of modern science.

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[3] Bernard d'Espagnat, *On PhysicsandPhilosophy,* Princeton University Press, Princeton, 2006, p. 17.

It can be stated that what constitutes the ultimate instance for the science of modern paradigm is stating the existence of an independent reality and objectives as such. This kind of reporting is constituted in the fundamental presupposition of the modern western rationality model. But there was another presupposition with a comparable influence in the western cultural model, its source being Augustine's writings. Starting from other grounds, those of the revelation, he pronounces the interrogation of *the ultimate instance* too as a question about the ultimate experience of the Christian life. What can be reached as the maximum of the Christian experience, what is the maximum to get in order to know God? These are questions that actually pose the problem of truthfulness, too.

Augustine considers that *esse* is not an act, but a disposition, and besides it has a static character. Unchangeability is a concept of Plato's inspiration destined to indicate the simplicity and the self identity with God[5]. God doesn't *have* the existence, but He *is* the existence, He is the self existence, *ipsum esse*. Augustine talks about an intellectual view as a first look of *the happy view* which the blessed ones will enjoy in heaven. There is an admitted possibility that *a direct view* of God is possible in this life. Simplified, the argumentative route looks like this: the fact that God is the divine essence in the ultimate instance and that He can be seen directly can be achieved only through an *intellectual view*[6]. This kind of view, *the ultimate instance view,* is only and exclusively a function of the intellect.

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[4] *Idem.*, p. 34.

[5] Augustin, *De Civitate Dei*, VIII, p. 6.

The radical possibility of the intellect to achieve the happy view will constitute an important element in the doctrine of Thomas d`Aquino, for whom God is the supreme intelligible object. Nevertheless he maintains the nuance difference that a created intellect, not even when it is lightened by divine light, cannot understand God as He understands Himself; the divine being remains seen but not understood. Anyway, each of the blessed ones can have that happy view so that their entire natural capacity (possibility) to see is fulfilled[7]. This view is not a succession, and it implies the understanding of the created ones (the fulfilling of the natural intellect capacity implies acquiring an understanding of the created ones), since the creatures which are seen in the divine being are all seen as a whole. Being a witness to such a view means being a witness to eternity, and the one who enjoys it takes part in eternal life[8].

Unlike the East, where God is not understood as belonging to the category of the being, but above the being, the West will take over Thomas's understanding according to which God is the supreme intelligible object. This description of the capacities of the intellect and especially its power to inform the divine being has become subsequently a central premise of what is called metaphysics in philosophy. In western modernity co-exist two understandings of what could be the ultimate instance, and they could be called *multitudinousness* and *happy view.* In the first case it is about a paradigm overturn (with great consequences which come from physics, but includes all science). The second case is an ultimate goal shared in one way or another by both the theology of Thomas' tradition (which was imposed as the official doctrine of Catholicism) and by the metaphysical speculation (which dominates a good interval in the history of western philosophy). Various analyses of the relations between the two types of presuppositions can be made, but what matters is that they were the basis for the articulation of the Western cultural model until the 19th century. The two aims at the ultimate instance share gnoseological optimism which emphasizes on the capacities of the intellect to reach the truth unequivocally. This optimism started to be doubted about at the middle of the 20th century. The experimental research in physics had to give up the classical explanatory model, with its rationalist – positivist optimism, in order to offer another consistent explanation to the reality in front of which it was placed: *the quantum reality*.

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[6] David Bradshaw, *Aristotle East and West – Metaphysics and the Division of Christendom*, Cambridge University Press, Cambridge, 2004, p. 224.

[7] Thomas d'Aquino, *Summa Contra Gentiles*, III, 59.4.

[8] David Bradshaw, *op. cit.*, p. 250.

According to Bernard d`Espagnat, physics is an empirical science, and we understand it as being a synthesis of the communicable experience. This makes us inclined to physical realism: to interpret this synthesis as being a reality description. But the actual results in physics make this statement impossible to be supported. Nowadays some physicians state that their science is actually an experience description and leave behind the question if the reality is described, while other physicians adopt a realistic position insisting on the evidence of realism, with all the difficulties implied by such a position[9].

Between the two positions there appear a few important differences. First of all, a statement can be objective if certain conditions, much more stringent in the realistic version, are fulfilled: the objectivity of the statements is questioned. Then in the realistic perspective the explanation refers to the existence of objects and their properties. In the other version (physics is nothing more than a sum of the human experience) there is no motivation for a construction on these lines. Thirdly, the discoverers of quantum mechanics state that their theory is a complete description of reality. They also state the principle of completeness: the wave function (the state vector) of a quantum object incorporates all the values which, according to physical realism, correspond to the structure and dynamic property of the object (there are no kinds of additional variables or as they are called "hidden"). Those who claim that physics is nothing more than a synthetic description of our knowledge cannot claim such a thing. Claiming that an entity assumed "inaccessible" does not exist physically is a statement open to critics similar to claiming that the entity exists.

Thus there appears a serious breach in the paradigm of physical realism, even in its more refined version, which is based on the data of quantum mechanics. Nowadays in physics there arises the question of "the real nature", of what is called "Something" in a rather negative language. The role assigned to that *Something* suggests the presence of an integrity, of a whole, a thesis totally unknown to classical physics. The theory of the quantum field refutes the multitudinous perspective of classical physics: the particles no longer play the role of constitutive material of the universe; the only reality which can be conceived, that it would constitute the basic reality, is the *Something*[10]. There are concepts, such as non separability and non localisation when it comes to indicating this reality model. The theory of non separability states that strictly speaking there is no distinct object. Our senses do not reveal the real constituency of the universe. There appear dramatic differences from the classical vision over the world: there is no longer an appeal to familiar concepts. There must be a passage from multitudinousness to a holistic vision, besides the necessity to renounce to the objectivist language.

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[9] Bernard d'Espagnat, *op. cit.*, p. 48.

This dramatic change of vision has multiple consequences, one of the most radical ones being precisely this need to use another language. It is not just about an adaptation of the concepts with which the physicians work in order to model their theories: a change in the overall world vision is involved, which introduces classical ontology. In order to indicate that *Something*, the imposed term was the *Reality* one, although there are discussions regarding the concept semantics.

The *per-se* reality notion is considered to be that totality *independent* from our possible ways of knowledge, correlated with the hypothesis that we have access to what we call reality (that we can state something true about it). Nowadays the reality concept includes in its semantic area *the representation* which we build about what is independent from us (it starts from the phenolmena, that is from human experience and it can be built without a direct reference to the *per-se* reality). It is clear that the present semantics of the reality concept in physics actually contains two major versions corresponding to the realistic description and to the representational one.

Nevertheless other acceptations of the reality notion functioned. A meaning that played an important role for a long period of time was described as *objectivist realism*, which was present in the Galilean ontology.

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[10] *Idem.*, p. 17.

This realism version is based on the importance given to groups of human impressions whose relative stability leads to considering them as real. These impressions were raised to the dignity of reality elements' representations. This realism version is valid within the relativity theory, although the event notion is primordial and not the object one. The objective state of any physical system is specified in each moment by a discreet or continuous set of known and unknown real numbers, cognoscible and non cognoscible; time and space are real, the localisation notion works).

Other versions for the use of the reality notion include *mathematical realism* (the reality notion independent from us has consistency, is cognoscible, but can be described only by mathematical means), *ontological realism* (by means of science we can acquire an exact and exhaustive knowledge of the ultimate reality; it is a version with extreme claims), *physical realism* (science is qualified for the qualitative description of the reality "as it is")[11]. The most radical meaning of the reality notion is called *real*, as it is about the reality independent from the mind (some people also include here the empirical reality, but it is a weakening of the "hard" signifycation of the concept). Another difference between reality and real has been made, taking into consideration the fact that the reality would be what enters the field of our experience and power of actual or virtual investigation, whereas real is what reality would be beyond this possibility, the "Something". In connection with this kind of distinction, the concept of *ultimate reality* was formulated, by which there is a designated limit, the border that our knowledge with all the handy possibilities has over the real at *a certain historical moment*. The ultimate reality does not have a certain content, but it is always constituted from the stage of human knowledge in a historical time over the "Something ".Having in view the above, we can find out that the crucial aspect of the discussion about how reality in present science is connected to the questions: Until, where and to what extent can we talk about a human experience constituted about reality? Until when and to what extent can we talk about knowing the reality as it is?

The thesis of *the happy view* can be interpreted as a version of radical gnoseological optimism, illustrated in recent physics by ontological realism. The presupposition that God is the supreme intelligible object has remained a decisive one in the articulation of the theological and philosophical medieval western discourse. We also find it in the statements made by Barlaam, the Calabrese monk, who started a famous dispute in the 14th century, the hesychast dispute (even if Barlaam was not under the direct influence of Thomas d'Aquino's statements, even if he supports a radical incognoscibility of God, yet in the Calabrese's thinking there is an intellectualist conception of knowing God and an essentialist philosophy[12]). Varlaam had been scandalised by the prayer method he had seen from the monk in that period, a practice that also involved a body-corporal position, which proved the existence of the presupposition that the body has a role on the way to know God. Varlaam's position assumed in the Latin West was that only the intellect was capable of the supreme knowledge act, the ascesis having the role of suspending the activity of the senses and passions in order to allow the intellect to reach this ultimate knowledge. The scandalous aspect for the Calabrese was the statement of those who practiced this method (called hesychast or *Jesus' prayer*) precisely that God's view *is done with the eyes of the body*. Gregory Palamas, subsequently Archbishop of Thessalonica, came to defend and justify the hesychast practice. But the defence of the hesychast position required explanations which could not be made in the terminological context of time. Palamas finds himself in the situation of signifying again or of explaining again the signification of certain terms. There had to be explained the signification which the hesychasm had for God's view, described as the view of the light or of God's manifestations, not of an essence. The goal of the hesychast practice is the view of Tabor's light, which can be understood only as an active process of continuous revelation of the one who is above the being. Here, the rejection of any possibility to know directly the divine nature, what characterises and defines God essentially is involved. Certainly the gnoseological stake is obvious: the ultimate knowledge (just like the knowledge of any kind) involves man as a whole, not only the intellect. The knowledge act has the dimension of a *relationship* between man and God (understood as a dynamic process and not as an essential view of a stable nature) – there is an anti-essentialism which corresponds to the anti-realist position in present physics.

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[11] *Idem.*, p. 28.

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[12] John Meyendorff, *A Study of Gregory Palamas*, trans. George Lawrence, St. Vladimir's Seminary Press, Crestwood, New York, 1998, p. 204.

A decisive term in explaining the non-essentialism of the hesychast doctrine is *energheia*, which Gregory Palamas takes over from Aristotle, but also from the usage of the previous Byzantine authors, a term to which it will enrich and nuance the signification area. Looking for a proper term for the light of Transfiguration, Palamas decides to use Aristotle's concept of *energeia*[13]. The decision of its usage is better understood nowadays when the studies (just like David Bradshaw is invoked here) reveal the spectacular complexity and the nuance abundance of the term, but also the fact that since Aristotle's times it has been the term that received an exceptional amount of usage. Aristotle's *energeia* is that kind of activity that is its own goal and can exist only in a state of fulfillment. It is both the substance cause and the thorough reality, regardless of the appearances it takes. For all of these reasons Aristotle finds energeia worthy of the highest appellation he can give it, that of divinity. By using the notion of *energeia* to create a distinction from essence or nature, Palamas does it cautiously, because the theological vocabulary of that time was too deeply marked by the essentialist categories of Greek philosophy in order to express the existentialist reality of the Supreme Being. Paradoxically, in the context of using this concept, the Byzantine author was too preoccupied to release the theological discourse from Aristotle's philosophical categories due to their inadequacy in expressing the mystery. For example, Palamas refuses to call the energies "qualities of God", because the quality notion cannot contain the liberty dimension in any way, whereas these energies are the expression of God's sovereign will.

Thus we better understand the stake of the term used by Gregory Palamas in explaining a critical aspect of his doctrine: the signification of the ultimate reality (in other words what content can be given to the reality notion when the ultimate instance situation is looked for). When discussing about the divine light (as *energeia*), Palamas states that it is a natural symbol, by denying that it is a created symbol. The argumentation is that a natural symbol always accompanies what it symbolises, and its existence depends on it, just like the aurora accompanies the sunset, and the heat accompanies the burning power of the fire because of the innate association. If *energeia* or the divine light has this meaning, then what we call a natural (or physical) reality has a much enlarged signification. The physical reality is not a static, inert one, but matter plus energy: it is something that can be described as an active alive process where we find the presence and the intentionality of a Person, and that as a natural dimension. On the other hand we can state that in this description the reality is constituted by the experience in the most radical way: the ultimate reality is the human experience of the uncreated energies. Any statement that would aim at something beyond the content of this experience, such as the direct knowledge of an essence, is rejected. In the same time the gnoseological pessimism is rejected: The Supreme Personal Reality is not incognoscible due to its transcendence, because it makes itself known by these manifestations called *energeia*.

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[13] David Bradshaw, *op .cit.*, p. 231.

In quantum mechanics, as well as in the hesychast doctrine, there appeared major language difficulties when there was the question about formulating adequate terms in order to indicate the content of the ultimate instance reality, as well as access to it. For example, when Gregory Palamas talks about the uncreated energies, he explains that these do not have a hypostasis or their own existence, but they result from the divine hypostases and constitute for us *signs* of God's existence. Palamas also explains that the divine essence, if it didn't have a distinct energy, would be totally inexistent and would be only a product of the imagination[14]. Palamas states that the energies cannot be separated from the essence, but they are not identical with it. They are "something else" other than the Holy Spirit, but they are not the divine essence[15]. This "Something" which the energies are and which cannot be identified with the Divine Person, nor with its essence. It is to some extent likewise the "Something" of Bernard d'Espagnat. After following the statements in quantum physics and in the hesychasm presented above, we notice a surprising approach between the two. The experiments in quantum physics led to the renouncing to the *physical realism;* the hesychast controversy led to stating the verifiability need of the spiritual experience, of the appeal to experience: thus the two investigation methods have their important convergence degree in the way they aimed at the reality. Certainly there are numerous differences which come from the different context and from the different interests under which the two reality perspectives were constituted. But what approaches them is the exigency under which they are, precisely the need to approach what we call *reality* in a very authentic way.

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[14] John Meyendorff, *op. cit.*, p. 216.

[15] *Idem.*, p. 225.

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Descriptive imaginary and the beginning of Quantum Mechanics[1]

Horia-Costin CHIRIAC

ABSTRACT: The beginning of Quantum Mechanics and some of its early evolutions represent the result of a continuous imaginative effort of surpasssing well-established commonsense claims regarding the structure of the physical reaity. As we shall see, in order to be accepted, the indeterministic and the probabilistic character of quantum systems needed the same sort of descriptive imaginative effort as the properties of mechanical systems did in Classical Mechanics, in comparison with Aristotelian physics. The evolution of descriptive imaginary that led to the birth of Quantum Mechanics was spectacular, and the transition from the private part of descriptive representtations to the public part of them has a special character in cases of Planck, Heisenberg, Bohr, Einstein and other main contributors. This paper will try to emphasize the idea that such important changes in the way physical reality is conceived have important consequences regarding the mentality of contemporary people in the knowledge society.

KEYWORDS: *Quantum mechanics, scientific representation, descriptive imaginary.*

In this present work our purpose is to identify some characteristics of the scientific representative dynamics in quantum physics. Of course, our

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final goal is to emphasize the specificity of descriptive imaginary, the way it evolves and the special criteria used to select descriptive representations in different turning points throughout the historical evolution of contemporary physics. But for the time being, we have chosen the early history of quantum mechanics as an illustrative example. In order to clarify not only the intentions, but also the means of our endeavor, it will be necessary to briefly present the conceptual tools we are going to use.

The main concept used in our investigation is that of descriptive imaginary. The subject of imaginary is a considerably wide one, at least if we take into account the continuous use of the products of our imaginative faculty when we try to investigate the world around us. Therefore, we believe it is necessary to make some distinctions among different types of imaginary, especially regarding their dynamics. Most of all, we consider these distinctions important as regards the use of the term imaginary in epistemology and philosophy of science.

Generally speaking, an imaginary thing is a thing that is the product of imaginative faculty and has no correspondent in the real world. However, at the level of scientific communities, from time to time, some representations are used to describe the world, being in the same time products of imaginative faculty. This happens because scientific discourse has multiple components, among them the easiest identifiable ones being the formal, mathematical one and the representational one, which is sometimes more or less visual.

Representations are used in many domains of human activity, from art to religion, but for us the main preoccupation is that of identifying the specificity of representative dynamics in natural sciences, especially in physics. What strikes us regarding this issue is the fact that scientists tend to treat the selection process through which they exchange representations or replace one representation to another one very carefully. So, we are trying to justify the distinction between the free use of imaginative faculty and the use of the same faculty within the limits of reason in order to invest its products with epistemological authority, as far as the description of the surrounding physical reality is concerned. Therefore, in the following, we decided to define descriptive imaginary as being the result of the process of producing representations by use of imaginative faculty with the purpose to describe as rigorous as possible the properties of the real world.

In fact, within the scientific discourse, a representation is used to replace the real physical entity or the physical process in a more sensorial intuitive way or in a more symbolic way. This substitutive process allows the representation to combine with other representations in order to form the descriptive discourse regarding reality. We will call this discursive image of the physical reality, scientific reality and we will try to follow its evolution throughout the historical period that was dominated by the constitutive process of Quantum Mechanics. As we will see, the first stages of this theory were dominated by radical changes on the level of descriptive imaginary that tormented, even the consciousness of Max Planck, the inventor of the theory. We deliberately chose exactly this episode because it could reveal to us some valuable information about the fictional nature of descriptive representations in natural sciences and about the complex process through which such representations gain epistemological authority.

As far as the concept of imaginary is involved in our investigation, we prefer to use in defining it, the results of French school of Studies about Imaginary, with authors like Gaston Bachelard, Gilbert Durand[2], Jacques le Goff or Jean-Jacques Wunemburger. Following these authors, we will consider imaginary as a term that reflects the evolution of representations as products if there is imaginative faculty at the level of social communities, in contrast with imagination that reflects the use of imaginative faculty at the individual level.

As Helene Vedrine pointed out[3], the history of imagination, as a philosophical concept is quite a tormented one, especially as regards to its relationship with knowledge. Starting with Plato and up to Sartre, philosophers regarded imagination with deep reserves regarding its contribution to the growth of knowledge, especially scientific knowledge, mainly because any imaginative excess was considered a big risk for the truthfulness of scientific discourse. Most of all, since the maturation of modern science of nature, in contrast with domains as astrology of alchemy, imagination was regarded as a dangerous source of fictions that could downgrade the scientific discourse from its goal of unveiling the correspondence truth about the real world in an objective and verifiable manner. Nonetheless, religious knowledge was also separated from imaginative activity, which was seen this time as a source of illusion and heresy.

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[2] Gilbert, Durand, *Structurile antropologice ale imaginarului*, Editura Univers Enciclopedic, Bucureşti, 2000, p. 22.

[3] Hélène,Védrine, *Les grandes conceptions de l'imaginaire*, de Platon à Sartre et Lacan, Librairie Générale Française, Paris, 1990, p. 27.

However, on one hand, quite recently, the contribution of imaginative faculty to establishing an image about the surrounding world was emphasized in a more convincing manner by authors like Cornelius Castoriadis who introduced the concept of radical imagination[4], which seems to influence even our perceptions in a certain manner. On the other hand, the presence of mental imagery and the use of sensory representations were also put into evidence by authors like Max Turner and Gilles Fauconnier, who demonstrated through psychological studies the surprising fact that simple sensations lay at the basis of mental activity of elaborating the most abstract scientific concepts[5]. In fact, this aspect seems to be a normal consequence of the development of the human brain, which is conditioned by the continuous flux of sensory information about the external world. Psychological experiments even proved that in the absence of such a neurological-informational flux, the human brain enters an abnormal state of consciousness.

Thus, the presence of mental imagery within the effort of the human mind for describing the surrounding world seems to be a fact that poses uncomfortable questions regarding the specificity of the use of imagination faculty in these conditions. Are there any special criteria that maintain the use of imagination and the dynamics of descriptive imaginary within the limits of rationality? We think there are a few, and emphasizing them is worthy for clarifying the differences among scientific imaginary and other types of imaginary with rich representative dynamics.

For easily identifying the specific criteria that influence the dynamics of descriptive imaginary, we choose a crucial moment in the development of quantum theory, more exactly the moment of its birth. Giving the fact that nowadays Quantum Mechanics maintains a very complex and difficult relationship with classical realism; any crucial moment in its historical development poses interesting problems as regards the ontological mutations within scientific discourse about physical real. These mutations affect the epistemological authority of different representations regarding the quantum level the organization of matter.

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[4] Cornelius, Castoriadis, „Radical Imagination and the Social Instituting Imaginary" (1994), in Curtis, David Ames (ed.), *The Castoriadis Reader*, Blackwell Publishers, New York, 1997, p. 321.

[5] Gilles, Fauconnier; Mark, Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities*, Perseus books Group, New York, 2002, p. 279.

Moreover, these mutations raised in time the problem of quantum mechanic's interpretations, which finally led to different epistemological positions regarding the relationship between scientific theory, measurement devices and the physical phenomena that represents the subject of investigation. From Einstein to Bohr, from Bohm to Everett, these positions form an interpretational halo of quantum mechanics, extremely rich as far as descriptive imaginary is concerned in spite the fact that within it the sensorial representations are not dominant, but the structural ones are.

On 14 December 1900, 47 year old Max Plank presented his theory regarding a possible solution for the difficult problem of "black body" radiation[6], in front of the German Society of Physics. Generally speaking, his colleagues were astonished by the novelty of his basic hypotheses and the skepticism of some of them was somehow justified by the fact that Planck himself seemed to make a huge effort to believe in his own ideas. To better understand the reason for such an attitude, we have to mention the fact that this was a crucial moment in the history of physics, a moment in which contemporary physics was born. The significance of Planck's hypotheses was so great, that it changed the scientific view about the world in the following half of the century.

The whole problem started from the discrepancy between experimental data and the predictions of thermodynamics of the XIX-th century regarding the radiation of the so-called "black body".

Although highly successful in various domains and capable of enhancing spectacular technical applications, thermodynamics and electrodynamics of the XIX-th century had a tough time to properly explain the way in which the radiation of the black body is emitted. This black body is in fact a hole in an empty metallic body with spherical shape, capable of absorbing any ray of light due to the fact that, once entered through the cavity into the spherical object, the light will be repeatedly reflected inside the spherical cavity and will no longer escape from the cavity through the hole. As a consequence, the hole is a one way route for any type of radiation, and that is why it is called the "black body".

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[6] J.P., Mc Evoy, Oscar Zarate, *La physique quantique sans aspirine*, Flammarion, Paris, 2002, p. 8.

Still, if the metallic body is heated, it emits thermal radiation through the hole, and this radiation with a particular spectrum is called black body radiation. The problem was the huge discrepancy between the theoretically predicted plot of the intensity of that radiation, and the plot resulted from experimental data. Scientists knew there was a mistake in their theory because, according to it, a person sat at a distance of two meters from an incandescent stove, for example, should have been completely burned, which was obviously absurd.

Before Planck, three other important physicists developed two different theories which were able to correctly predict the beginning part of the radiation plot, respectively the last part of it. They were, on one hand, Lord Rayleigh and Sir James Jeans and on the other hand, Wilhelm Wien. Since their results were partial, after a long struggle to find an alternative, more classical explanation, Max Planck came up with a staggering hypothesis. He assumed that the black body radiation was emitted discontinuously by a group of harmonic oscillators that are in fact the atoms that compose the metallic spherical incandescent object. Being heated, the radiation emitted by them was discrete, in direct corresponddence with the energetic levels of the electrons within the atoms.

Successively, Planck elaborated two variants of the mathematical formalism that would sustain the theory. In the first one he used two constants, but in the second one he managed to use a single constant for describing the way in which the energy of the black body was emitted, the famous Planck constant $\hbar$. The plot of radiation obtained in accordance with the predictions of the theory matched perfectly with the experimental data. But the core hypothesis of his theory was very hard to be accepted, even by Planck himself. A proof in this respect is the fact that he continued to search for an alternative explanation for many years after his new theory of quanta was launched. To understand why, we should analyze some of the basic princeples of the XIX-th century physics and the image about the real world build on them.

Because such a task would exceed the dimension of this present paper, we prefer to resume them, saying that the image of the world based on those six principles[7] was a deterministic one in which causality prevailed, the properties of light being completely described by Maxwell's electromagnetism. In such a world there would be no limit for measuring precisely and simultaneously the parameters that describe a physical system. Many of these elements that characterize the image about the physical world cultivated by XIX-th century physics were eventually changed by the later development of quantum theory; therefore this process posed enormous pressure on scientists, not only from a technical, mathematical point of view but also from a philosophical point of view.

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[7] J.P., Mc Evoy, Oscar Zarate, *La physique quantique sans aspirine*, Flammarion, Paris, 2002, pp. 8-9.

As to Planck, he started his work from the discrepancy between existent theories and the experimental data regarding the black body radiation, the so-called "the catastrophe of ultraviolet" and, as we already mentioned, he ended up by making a shocking assumption: that the walls of the incandescent cavity would contain a set of electric oscillators that vibrates because of the thermal agitation and that the energy emitted by them is not produced in a continuous flux, but discontinuously, in portions. These energy units, which Planck called quanta, are proportional to the frequencies of oscillators, the energy of a quanta increasing at the same time to the frequency of electromagnetic radiation ($E = h\nu$, E being the energy of quanta, h is Planck's constant, and ν the frequency of radiation).

This assumption of quantized radiation introduced h, an extremely small constant ($6{,}62608 \times 10^{-34}$ joules seconds, or "ergs" multiplied by "seconds") whose properties were far from being understood at that time; in addition, it was in a flagrant contradiction to all of what electromagnetic radiation meant in classical Physics. This happened, because the units in which h is measured, energy (ergs) multiplied by time (seconds), are called "actions" and do not normally appear in classical Physics. There is no law of conservation of "action", as there are laws of conservation of mass or energy in Classical Mechanics. Furthermore, a constant "action" remains absolutely constant, and it has the same size for any observer in space and time, regardless of the reference system. In other words, h is a four-dimensional constant, and its properties can be fully understood only inside of the Theory of Relativity[8].

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[8] John, Gribbin, *In Search of Schrödinger's Cat: Quantum Physics and Reality*, Transworld Publishers, Berkshire, 1991, p. 43.

One has enough reasons to consider that the quantum hypothesis represents a remarkable leap, a crucial moment in the historical evolution of descriptive imaginary. The way of coming out of the impasse indicated by Planck represents a bold solution, completely different from the classic conceptual framework that was dominating physics in that period. Moreover, the quantization of energy exchange between matter and radiation in the form of quanta of energy is exactly at the origin of the name given to the theory.

Perhaps Max Planck's idea, in spite of having the concrete result of getting an agreement between theory and experimental results regarding the spectrum of the radiation of black body, would have remained for a long time just at the level of curiosity among physicists, if it were not for Albert Einstein's use in 1905 of the quantum hypothesis to explain the photoelectric effect discovered experimentally by Philipp Lenard. He explained the ejection of the electrons from the surface of a metal body when it is bombarded with a beam of monochromatic light, using the photon hypothesis. In other words, Einstein argued the radical idea that quantization is not suitable only for energy exchange, but also characterizes the intrinsic nature of the electromagnetic field, consisting of quanta. Calling the quanta of light *photons*, Einstein brought to equality (again) the two divergent theories about the nature of light: the wave theory (Huygens) and the corpuscular theory (Newton). After a long domination of the wave theory, due to Fresnel's contribution, Einstein came with the assumption that the electromagnetic radiation is also composed of small corpuscles.

In order to appreciate the novelty of Einstein's idea, which established indirectly quantum hypothesis of Planck, it would be sufficient to recall that for a photon the beginning moment of our universe coincides with present moment, since such a particle moves through the universe with the speed of light. Another innovative feature of the photon appears in a Feynmann chart[9] that represents the particles trajectories by arrows on a space/time graph. Thus, photons appear as moving over time in both directions, which is why the photon is considered as being in the same time its own anti-particle[10].

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[9] Richard, P. Feynman, *The Feynman Lectures on Physics, volume III: Quantum Mechanics,* Addison – Wesley Publishing Company, New York, 1966, cap. 7, p. 2.

[10] John Gribbin, *In Search of Schrödinger's Cat: Quantum Physics and Reality,* Transworld Publishers, Berkshire, 1991, p. 190.

Einstein did not stop at the simple description of the nature of the electromagnetic field, but has shown as well how the quantification of crystalline networks vibration enables the interpretation of experimental results regarding the specific heat of solids at low temperature. Thus, quantum statistical physics was born.

One can easily observe that quantum theory aroused within the struggle of scientists for clarifying two problems associated with the macroscopic level of matter organization: the thermodynamics of the black body and the thermodynamics of solids. However, the main direction of progress for Quantum Theory was the physics of micro cosmos, up to the subatomic level of matter organization.

It is worthy to notice that the quantum hypothesis was adopted *in spite* of any aesthetical, philosophical or psychological preferences of its creator. Who know today very well that Planck elaborated the mathematical part of his theory in two stages, introducing in the beginning two constants, but managing in the end to combine them into one single constant: the famous h constant. So intriguing and uncomfortable was the quantum hypothesis for him that he tried repeatedly afterwards to pursue alternative ways of explaining the experimental results concerning the black body radiation. Long after his younger physicist fellows adopted his theory, he seemed to be "unhappy" with it, for the obvious reason that such a theory inflicted through its consequences the radical reconstruction of the image about the physical real established on the principles of the XIX-th century physics. Traditionally, the idea of discontinuity was not considered compatible with the radiation phenomenon, nor with the concept of energy. Moreover, what will intrigue the scientists supplementary was the coexistence of the continuous character of matter with the discontinuous one. Finally, the old and difficult problem of classical realism and the relation of quantum mechanics with it posed even more pressure on the scientists trained in the "old school" of classical physics, as Planck was.

Starting from the chosen example, we can now emphasize at least two pragmatic criteria that influence the dynamic of scientific representations in natural sciences. First, beyond any aesthetical or psychological preferences, the only new descriptive representations allowed to become part of the scientific discourse are the ones capable of improving the concordance degree between theoretical predictions and experimental data, provided that the formal structure of the entire discourse preserves its internal coherence.

The direct consequence of this is that almost any visual aspect of representations used in contemporary physics is accompanied by a numerical, analytical aspect. In this way, the whole discourse is characterized by the complementarities between the qualitative component and the quantitative component of it.

The second criterion refers to what we call "the principle of minimal adding". This principle prevents scientific description of being overpopulated by an inflationary number of dispensable descriptive representations. It is the case with the effort Planck made to refine his theory in order to contain only one physical constant instead of two. This criterion allows scientists to avoid the development of a metaphysical inflationary scientific discourse, another good example being the elimination of the concept of "ether" by Einstein when he came up with his relativistic hypothesis.

In conclusion, we want to emphasize the special character of what we called "descriptive imaginary" in the beginning of this paper. It seems that scientific representations that form the scientific discourse of natural sciences are meant to describe the characteristics of the physical real, but in order to be able to do that in a rigorous manner, their evolution needs to obey to certain criteria that assure the rational and objective nature of the scientific discourse. However, in the same time, the main source for such representations is the human mind, its creative capabilities being enhanced significantly by the use of imaginative faculty, hence, the fictional character of such representations. In order to maintain their descriptive capacity and to invest them with epistemic authority, specific pragmatic criteria, like those mentioned above, are used as regards to their selection and use.

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Fuzzy Sets in Image Processing[1]

Mihaela COSTIN

ABSTRACT: Accurate image processing techniques suppose sophisticated software to corroborate outstanding procedures, due to the fact that different physical phenomena are giving relevant details from complementary points of view. Dissimilar aspects, completing each other are optimally using fuzzy linguistic values to describe the degree of the phenomena evolution after different schemes and experts' subjective opinions. Finding a reliable, repeatable reference in a record time, using artificial intelligence procedures is important for inferring a decision. A complex amount of details is used to precisely establish a diagnosis in a record time. High-quality images and accurate interpretations, in semi-automatic, human-assisted procedures, are desired. Fuzzy systems intricate with techniques of handling heterogeneous information in weighted decisions are really helpful tools.

KEYWORDS: fuzzy systems, weighted decision, tumor detection, medical imaging, image processing and understanding, vision

Introduction

Artificial architectures take into account behavior manifestations modeling brain functions and its structural proprieties. In this idea, fuzzy sets and fuzzy logic [1] come to model the human manner of reasoning as an extension to binary, crisp and computing solutions, introducing a third value

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of truth. These are widely used solutions that might give salient information on images in an easy way and reinforce the domain of artificial vision. They might be applied in different domains, such as medicine, art, industry, research... etc.

A general schema of image processing is presented in Fig. 1.

The image that will be analyzed by the system is first preprocessed depending on the purpose that the automatic procedures are going to accomplish.

Most of the images are noisy and denoising is necessary (noise removal).

Other images comprise information that is too large, therefore only the interest areas are to be selected, on specific criteria. This process may be done within the segmentation stage. There are quite numerous procedures of segmentation [2], depending on the purpose of this operation.

The blurred images need to be corrected (thinning lines or reconstructing them, augmenting the number of pixels on edges). The main information carried by the images needs to be highlighted and reinforced.

Fig. 1. Image processing in decision or diagnose systems

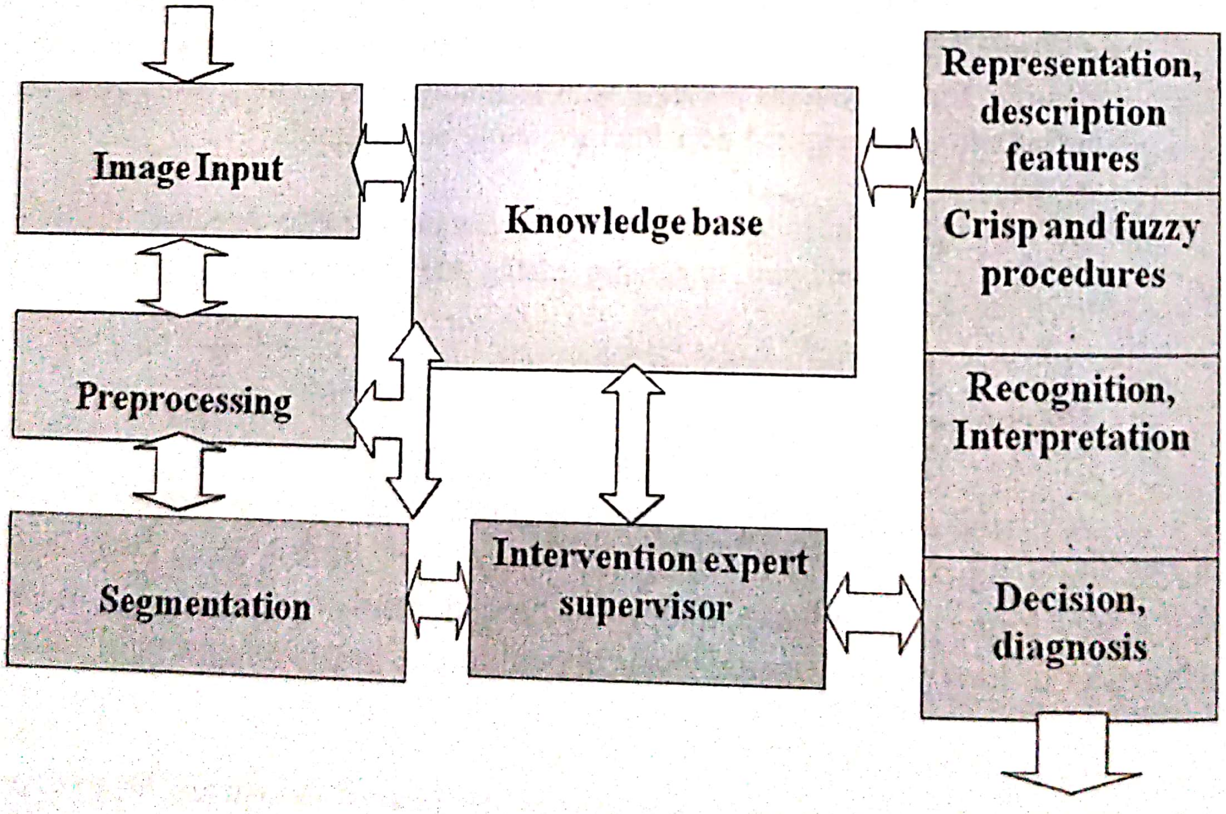


Image Input
Preprocessing
Segmentation
Knowledge base
Intervention expert supervisor
Representation, description features
Crisp and fuzzy procedures
Recognition, Interpretation
Decision, diagnosis

Knowledge which is necessary for a specific type of image, in order to diagnose or to decide on certain desired aspects comprised, are structuring the knowledge base. The rules which are coordinating the necessary stages of processing, formulated by experts, are included in the rule base.

As these stages are complex enough for a computing system (even if they seem simple for humans), they are supervised and benefit from expert intervention.

Usually images are too large in dimensions and too complex to be retained in the form they are initially given. In order to be easily retrieved and stored, they are indexed, annotated and coded in vectors, retaining only the main features for description, recoding features in simple values that might be stored as vectors.

In this stage, both crisp and fuzzy procedures might be used. Based on crisp and fuzzy values, a recognition and an interpretation of images is possible, when a large group of images is stocked in a database which is indexed, annotated or stored in a feature vector form.

When the appropriated images and features are selected, a decision (or, for some medical or technical images a diagnosis) is possible, reasoning on the weighted features of those images.

Image processing – short summary of basic features

A monochrome image is an array of values.

There are two types of discretization involved:

1) spatial sampling (pixels – “picture elements”) their position in space, on the image... and
2) intensity quantization (grey level values – up to 256 levels, black and white, 0, 1, being the extremes 0, respectively 256)

Image processing – main steps

Image enhancement: improve the quality of an image and accentuate particular features.

A very good book in this domain was written by Milan Sonka [2] and in Romania by Mihai Bulea [3].

For noise reduction (denoising), Fourier Transforms, a filter applied on the image in order to remove the “salt and pepper noise” and an inverse Fourier Transform, are often applied.

Edge detection and edge sharpening are usually done by applying diferential functions (derivates) on images. Usually they are formulated in "masks" – standard matrix with values resulting from these simple mathematical functions [2] meant to "identify" the irregularities in grey levels, on images.

Erosion/dilation on edges: erosion is one of two fundamental operations (the other being dilation) in morphological image processing from which all other morphological operations are based; originally defined for binary images, later it was extended to greyscale images.

The erosion operation noted Θ of the binary image A by the structuring element B might be given by a mathematical expression as the following one:

$$A \Theta B = \bigcap_{b\in B} A_{-b} \tag{1}$$

The delation operation noted $\oplus$ usually uses a structuring element for probing and expanding the shapes contained in the input image. The dilation of A by B is defined as follows:

$$A \oplus B = \bigcup_{b\in B} A_b \tag{2}$$

Shape detection (lines, circles, angles/corners detection) is intensively studied and also by fuzzy methods, too.

Symmetry detection methods are depending on the particular problem to be solved. Usually the correlation between the two sides of the object is computed, in order to identify identical symmetry.

Colour analysis proved to be very important as we may group images based on colour composition and display.

Texture detection is also an important issue to be identified on selected areas.

Salience area selection might be done by computing a saliency map of the image [4], [5], [6]. Entropy computing usually gives salient areas in images. Salience identification has a lot of applications, from blind human visual prosthesis [7] to robotic vision [8].

Rules' identification depends on the domain where the image might be assigned. They are differing upon the scope we are following: the images might represent landscapes – therefore the rules have a description form, they might represent persons or medical analysis [9] of those persons.

Obviously these rules are following the tasks assigned to the automatic systems.

Image processing has become an important domain that rapidly developed in the last three decades, intricate with the main technological discoveries [10]÷[14].

Fuzzy processing

The ideas comprised in the theory of fuzzy sets were easily adopted due to their naturalness and relative simplicity [1], [10], [11].

In order to define a set of gray levels with the property "dark", in classical set theory, we have to determine a threshold, say the gray level 80. Gray levels between 0 and 80 are elements of this set; the others do not belong to the set.

"Darkness" is expressed by a "degree". Imprecision is better modelled by using fuzzy sets. To define this set, we need two thresholds, say gray levels of 30 and 130.

All gray levels that are less than 30 are the full member of the set. All gray levels that are greater than 130 are not members of the set. The gray levels between 30 and 130, have a partial membership in the set.

Let's define an image A of size MxN with L gray levels denoted $g = 0,1,2,\ldots,L-1$,

$$A = \bigcup_{m=1}^{M}\bigcup_{n=1}^{N} \frac{\mu_{mn}}{g_{mn}} \tag{3}$$

where the membership function of $mn\text{-}th$ pixel is μ_{mn}:

$$\mu_{mn} \in [0,1] \tag{4}$$

Therefore, "A" can be defined as an array of fuzzy singletons (fuzzy sets with only one supporting point) indicating the membership value of each pixel in regards to a predefined image property (brightness, smoothness, edginess, etc) [14].

Fuzzy image processing consists of:

- fuzzification F,
- suitable operation O on membership values

and, if necessary,

- defuzzification D.

The output B of the system for an input A is given by the processing chain:

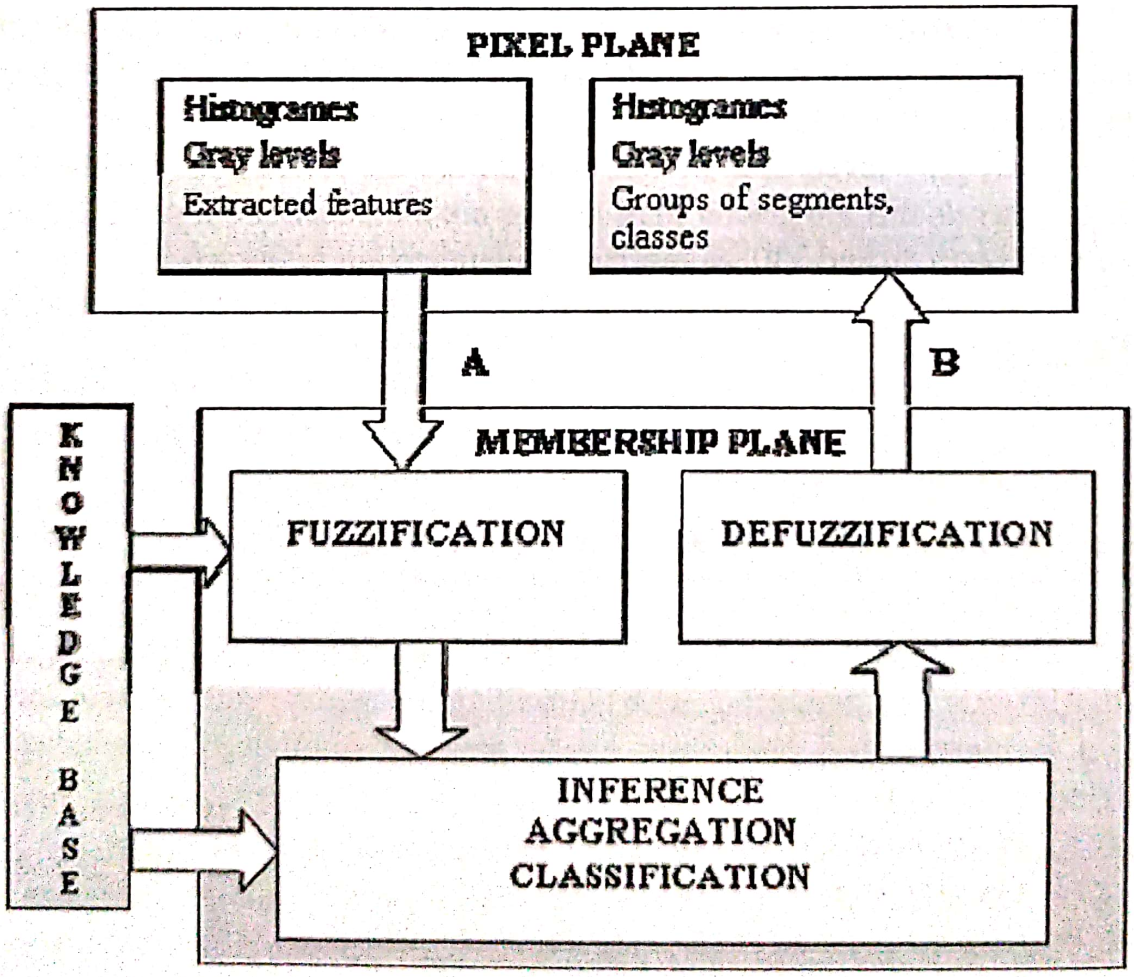
$$B=D(O(F(A))) \quad (5)$$

Comparing to other modalities of image processing here, the input data A (which might be different kinds of histograms, gray levels, colors, textures, features, …) are processed in the membership plane with:

- fuzzy logic,
- fuzzy set theory,
- fuzzy measures,

in order to modify the membership values, to aggregate the membership values, to cluster data, or to make decisions using fuzzy inference.

Fig. 2. The general structure of fuzzy image processing


PIXEL PLANE
Histogrames
Gray levels
Extracted features
Histogrames
Gray levels
Groups of segments, classes
A
B
KNOWLEDGE BASE
MEMBERSHIP PLANE
FUZZIFICATION
DEFUZZIFICATION
INFERENCE
AGGREGATION
CLASSIFICATION

Fuzzy Image Enhancement

Contrast Adaptation

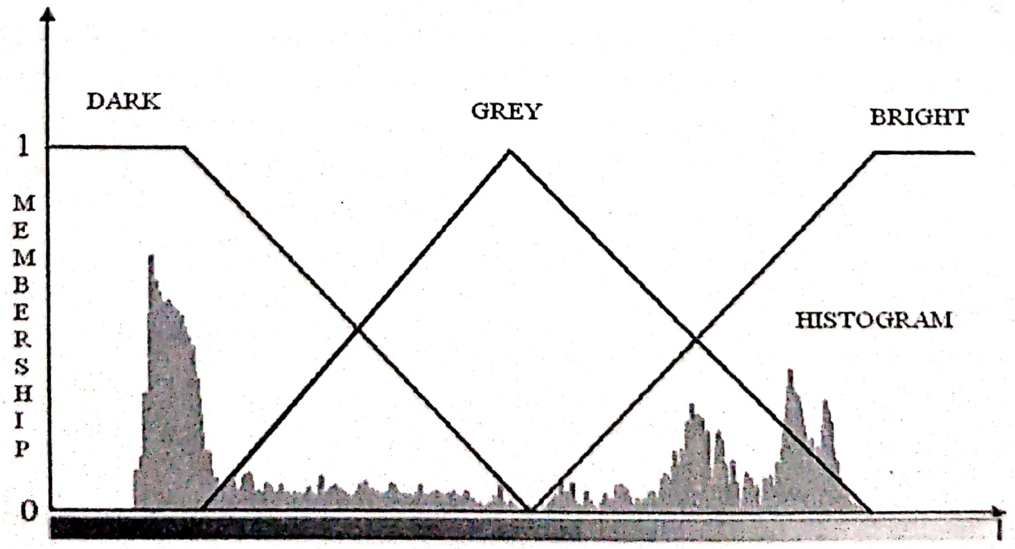
To develop new techniques for contrast improvement, a fuzzy set theory may be applied. The theory was developed in Pal 1981 [15], [16]. For this, it is necessary to (a) define the membership function, (b) modify the membership values and (c) generate new gray-levels.

Special methods for contrast improvement have been conceived using "fuzzy expected values", detailed in an early paper written by Craig and Schneider in 1992 [17]. The steps to be followed are: (a) calculate the image histogram; (b) determine the fuzzy expected value (FEV); (c) calculate the distance of gray-levels from FEV; (d) generate new gray-levels.

Contrast Improvement based on Fuzzy IF-THEN Rules

A fuzzy method for processing the contrast is improving it with the fuzzy IF-THEN Rules applied to histograms, based on the method developed by Tizhoosh [19], [20]: (a) establish the parameters of the inference system (input features, membership functions, etc.); (b) fuzzification of the actual pixel (memberships to the dark, gray and bright sets of pixels); (c) inference (for example "if dark then darker", "if gray then gray", "if bright then brighter"); (d) defuzzification of the inference result by the use of three singletons [20].

Fig. 3. General schema of histogram fuzzification applied in image contrast processing



Sharpening/Noise Reduction

Noise reduction on the image may be done using Fourier Transforms, yet, this way it is applied in the same way on the entire surface of the image.

When a fuzzy procedure is used, the gray levels are applied differently on different areas. An input is a typical non-stationary signal. In order to process it, the non-stationarity must be taken into consideration. The system parameters have to be controlled depending on the local characteristics of the image.

If an image presents additive random noise, usual filtering techniques are not effective for noise removal, because they are smoothing the edges as well. The system must distinguish flat regional parts of the image from those abruptly changing (edges) and then it has to specially set the system parameters for each part independently.

This kind of control is not possible to be performed definitely due to the fact that the definition of the signal characteristics and the rules to describe how to control the system's parameters are usually expressed in ambiguous forms [21]. It is possible to say that: IF the signal difference between two adjacent pixels is small THEN they are included in the same region. As an example we will present a method to work with fuzzy measures on images [22].

"It is difficult to find a definite threshold in order to distinguish a small signal difference from large differences: in some part of the edges the signal difference may be relatively small, and in some part of the flat region the signal difference may be relatively large because of the noise. We may say that the window size of the noise-removal filter must be large enough in the flat region, while it must be small enough in that part of the edges... being difficult to define the large window size and the small window size definitely". [22]. Fuzzy rule-based image processing for noise removal and edge extraction is taking this ambiguity into consideration.

The method detailed in [22] uses some standard well-known notations, cited here:

the input image signal at the pixel (i,j) is denoted $x(i,j)$;

the output of the image processing system $y(i,j)$ is generally expressed as a function of $X(i,j)$, a set of input image signals

$x(i-k, j-m)$ *around* $x(i,j)$ (*with* $-N \leq k \leq N$ *and* $-N \leq m \leq N$)

w(k,m) – are the weights.

The output of the weighted averaging filter is expressed by the following formula [22]:

$$y(i,j) = \frac{\sum_{k=-N}^{N} \sum_{m=-N}^{N} w(k,m) \cdot x(i-k, j-m)}{\sum_{k=-N}^{N} \sum_{m=-N}^{N} w(k,m)} \qquad (6)$$

If the image signal is flat or contains tiny changes, this weighted averaging filter is powerful enough to reduce additive random noise if the *w(k,m)* take values as in the relation below.

$$w(k,m) = 1 \qquad \forall k,\ \forall m \qquad (7)$$

An image signal usually contains large amplitude abrupt-changes (edges), therefore this filter using *w(k,m)* given in the equation (7) makes the image blurred when it is used for noise reduction. In order to keep the edges sharp, the weights must take values as in relation (8) and in this case the noise can't be smoothed at all. Therefore, the value of the weight *w(k,m)* should be controlled depending on the local characteristics of the image signal so that image signals are averaged inside the edges.

$$w(k,m) = \begin{cases} 1, & \text{for } k = m = 0 \\ 0, & \text{else} \end{cases} \qquad 8)$$

As it is one of the basic methods of treatment we will detail it more based on the available literature [21]÷[23]. Image signals have to be averaged inside the edges respecting rules like this [23]:

IF the pixel *(i-k,j-m)* belongs to the same flat area as the pixel *(i,j)*,

THEN *the weight w(k,m)* should take value one,

but

IF *n* edge exists between these two pixels,

THEN the weight *w(k,m),* should be equal to zero - because such a pixel should not be used in the averaging.

The amplitude of the signal difference $|x(i,j)-x(i-k,j-m)|$ can be used to separate the two states.

IF the difference $|x(i,j)-x(i-k,j-m)|$ is small,

THEN $x(i-k,j-m)$ and $x(i,j)$ are supposed to be in the same flat area,

but,

IF not,

THEN they are supposed to be in different areas.

Based on such kinds of rules, these particular problems that arise in different parts of the image, can be treated. Further, an application on special medical images conceive, is presented.

Medical imaging application of fuzzy processing

A dedicated medical application is described, in the domain of radiometric measures of the microwave emissions of the human body (inner temperature) underlining a modality of plotting, with an improved display, the inside temperature differences and dispersions, taking into account the fact that every inflammatory process is accompanied by an increase in temperature .

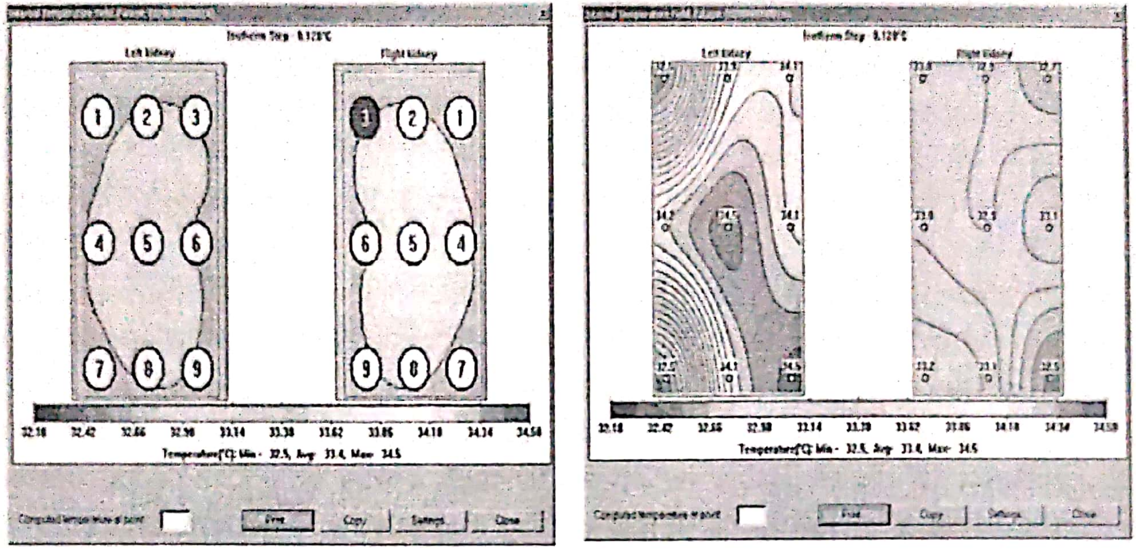
Kidneys temperature fuzzy map

This further application presents the kidneys' temperature fuzzy map for tumors using a dedicated software in Visual C++. A radiometric map which measures in the microwave domain the body temperatures in order to plot a map of thermo-registrations is realized using the temperature information obtained with a special radiometer (which is giving the body temperatures at distances of 2-3 cm under the skin, due to the specific wavelength implied).

If a suspicion regarding an inflammatory process is detected, the preliminary measurements have to be followed by further examinations.

Indicating the regions where big temperature differences exist among the right side and the left side (on the two kidneys), when anomalies are detected, supplementary measurements (even a biopsy) are to be done for obtaining an accurate diagnosis.

Fig. 4. Image processing used to represent kidneys' dissimilarities in functioning



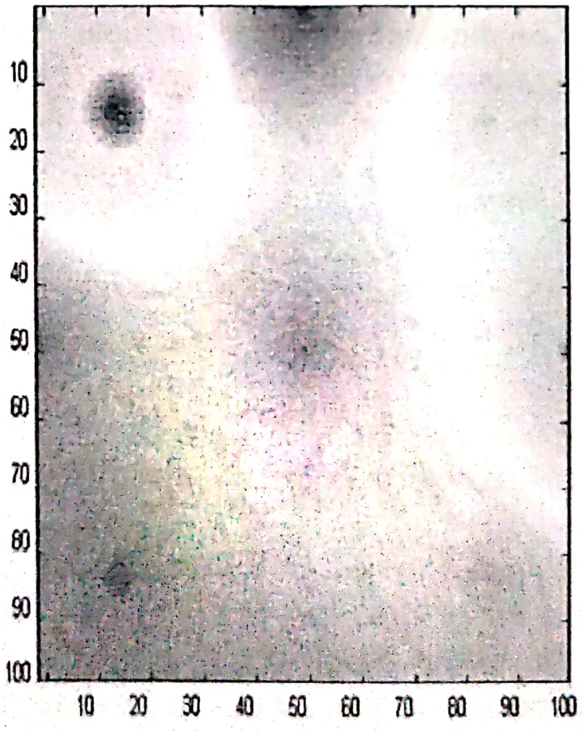
Isotherm Step: 0.12°C

Temperature[°C]: Min - 32.5, Avg 33.4, Max 34.5

Left kidney
Right kidney
1
2
3
4
5
6
7
8
9
32.18
32.42
32.66
32.90
33.14
33.38
33.62
33.86
34.10
34.34
34.58
Computed temperature at point
Print
Copy
Settings
Close

(left kidney presents higher temperatures due abnormal functioning, subject of further investigations) – the continuous lines are isotherms generated with a designed soft program.

Fig. 5. Frame of an image constructed upon the radiometric measurements – smoothed lines with fuzzy procedures



10
20
30
40
50
60
70
80
90
100
10
20
30
40
50
60
70
80
90
100

Color Map Generation for Temperature Map Design

Radiometric measurements are possible to be realized in fixed points (a first method) or in variable points (a second method). For every point I(x,y), temperature map generation is accomplished by a method which seemed to us to be optimal.

By a trial and error procedure we detected the appropriate formula in order to plot the image (the temperature map of the kidneys), taking into consideration the points chosen for radiometric measures. This formula was also applied in our former studies to display breast temperature maps and to correct our previous software dedicated for this.

In this case the temperature of a point is influenced by the temperatures of the neighboring points in such a way which is proportional with the inverse of the third power of the distance. For generalization, we denoted distance with d and the m^{-th} power of this distance is d^m.

Therefore the temperature measured in a point is weighted around it by a weight

$$w_k = \frac{1}{d_k^m} . \tag{9}$$

The temperature in the P point is expressed by formula (9), which is more appropriated in order to estimate a volumetric propagation of temperature, than a combination of linear functions. We preferred such a formula in order to combine it with the fuzzy tool, further using linguistic variables.

$$temp_P = \frac{\sum_{k=1}^{n} temp_K \frac{1}{d_k^m}}{\sum_{k=1}^{n} \frac{1}{d_k^m}}, \qquad d_k^m \neq 0 \tag{10}$$

Towards a Diagnosis Support System

A diagnosis support system (DSS) implies the use of a risk estimation fuzzy system. Fuzzy logic may be used in the module, designed for the computation of the left/right side differences, because it permits adequate information description (employing linguistic variables as *low difference,* *somehow alike*, *very important/high difference*, etc.), allowing for the formalization of expert knowledge in the diagnosis estimation.

The knowledge base structure might be modified according to physician specifications.

With two different kinds of fuzzy systems, for example the first one a Sugeno type (1) and the second one might be Mamdani type (2), a Type II fuzzy model may be approached.

The first fuzzy system (Sugeno type) is used in order to ask for more supplementary measurements:

R21: **IF** current point temperature t_{pc} **is HIGH** and neighbor temperature t_{nk} **is LOW**,

THEN γ**=3**

(supplementary measurements are needed in 3 points around P).

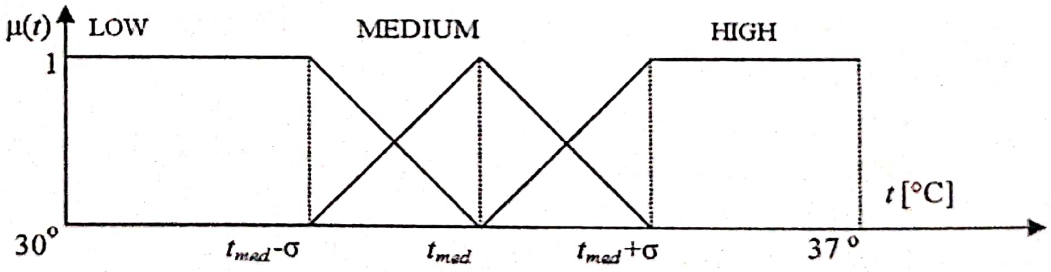
R22: **IF** current point temperature t_{pc} **is HIGH** and the neighboring temperature t_{nk} **is MEDIUM,**

THEN γ **=2.**

R23: **IF** current point temperature t_{pc} **is HIGH** and the neighboring temperature t_{nk} **is HIGH,**

THEN γ **=1**

Fig. 6. Temperature fuzzification in order to conceive a diagnosis system



The membership function used for the fuzzy linguistic attributes LOW, MEDIUM, HIGH, referring to temperatures, have triangle forms.

Table 1. Table of values associated to fuzzy inference rules for the asymmetry index estimation

t_{nk} \ t_{pc}	LOW	MEDIUM	HIGH
LOW	0	2	3
MEDIUM	1	0	2
HIGH	3	2	1

In table 1, the rules output are associated to functional for the asymmetry estimation; when this index has a small value (decreasing to zero) a low asymmetry area is identified (e.g. high symmetry area and small temperature, gives a *decreased possibility* of an abnormal area).

When the defuzzification value of the output singletons is high, therefore we identified a big asymmetry area implying an increased possibility of abnormality. This are the inference fuzzy rule of the first fuzzy system.

We may conceive the fuzzy inference rules in different forms, one of them being the following one:

- **IF** the temperature difference **is MEDIUM,**
- **AND** current point temperature **is MEDIUM**
  THEN *the abnormality possibility* **is N (INCREASED).**
- **IF the** temperature difference **is LOW**
- **AND** the current point temperature **is MEDIUM**
  THEN *the abnormality possibility* **is D (DICREASED)**
- **IF** temperature difference **is LARGE,**
- **AND** current point temperature is HIGH

THEN *the abnormality possibility* **is vI (very IMPORTANT).**

The intensifiers are somehow standardised, but they might be adapted as well, for example it is known that the use of the *very* intensifier implies a power of the membership function [24].

$$\mu_{very}(x) = \mu(x)^2 \tag{11}$$

With rules as the above examples a new table of values is plotted.

The operators used for these fuzzy operations are the classical ones, in a Mamdani sense:
AND: min (μ_A, μ_B), NOT(1 - μ), OR: max (μ_A, μ_B) and a classic defuzzification is used for Sugeno systems [22]:

$$y_{Sugeno} = \frac{\sum_k \beta_k \cdot \mu^*(x)}{\sum_k \mu^*(x)} \tag{12}$$

$$\mu^*(x) = \min(\mu(t_{pc0}), \mu(t_{nk0})) \tag{13}$$

The Mamdani system implies a method of defuzzification using the centre of gravity (COG), where t_{pc0}, t_{nk0} and dt_0 are the crisp values of the inputs into the system before applying the fuzzy block of processing. The inference type of processing is max-prod, and the inference rules are connected by the reunion operation max(μ_A, μ_B).

$$y_{center\_of\_gravity} = \frac{\int \mu^*(y) \cdot y \cdot dy}{\int \mu^*(y) \cdot dy} \tag{14}$$

$$\mu^*(y) = \max \; prod \; (\min(\mu(t_{CD\,0}), \mu(dt_0)), \mu(abn.possib)) \tag{15}$$

The defuzzified outputs of the fuzzy systems from the first level, constitute inputs in rules of the type:

- **IF** the *asymmetry index* is between [0 1.5] and *abnormality possibility is* between [0, 1]
  THEN normal pathology….
- **IF** the *asymmetry index* is between [3.5 4] and *abnormality possibility* is between [3, 4]
  THEN suspicion of malignant tumour…
- **IF** the *asymmetry index* is between [2.5 4] and *abnormality possibility* is between [2, 3]
  THEN abnormal pathology (compulsory further investigations).

Note: there are cases of false thermo effects, due to infections or collateral traumatisms which have to be taken into consideration.

Conclusions and further work

Our research makes a short overview of some methods and fuzzy techniques, referring to the existent fuzzy image processing models and applications. With a fuzzy method we computed some parameters for a better display and diagnosis in medical imaging in order to overpass the natural gaps existing in plotting these medical analyses as well as to take into consideration the large range of possibilities, expressed by verbal attributes. Fuzzy sets and logics, have a natural manner of completing the deterministic, crisp way, of computing, and apply in quite a large variety of topics regarding image processing. Being nonlinear, knowledge-based and robust, fuzzy techniques offer a good framework for a wide range of image processing algorithms. Yet, even if the theoretical models are exponentially developing, the fuzzy rule-based techniques are expensive in computing if they use the spatial image information. The resolution of this drawback resides in the hardware solutions implemented for practical reasons and the use of these systems in reasonable models which do not increase in an uncontrollable manner the computing complexity.

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Considering Understanding Through Scientific Models[1]

Richard DAVID-RUS

ABSTRACT: Scientific understanding has been a rather neglected topic in philosophy of science though it was linked to the major topic of explanation. Recent developments in the discipline have brought an increase in interest in the subject of scientific understanding. The standard scientific units that were considered to provide us explanation and understanding were laws, theories or even larger units, such as entire corpuses of knowledge. Models were totally ignored as possible bearers of explanation and understanding. My aim in this paper is to tackle the issue of how we might approach understanding in a modeling context. In a first step I will track the history of the subject in philosophy of science and identify the major presuppositions that determined the way it was treated. In a second step I will look at the characteristics that have to be reconsidered, and I will concentrate on two major ones: the global character of understanding, and its close connection to an approach on explanation. I will argue that in order to properly consider understanding in a modeling context we have to adopt a pluralistic perspective.

KEYWORDS: *scientific understanding, scientific inquiry, scientific models*

Scientific understanding is a major epistemic goal of scientific inquiry. Nevertheless it did not attract the attention of philosophers and enjoy a prime status as did the explanation subject. The last two decades have brought a

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change of the situation in the context of the new tendencies in the philosophy of science. Still the research on the topic is in its exploratory phase and different authors have tried to tackle various aspects of it. My aim in this paper will be to address the issue from a modeling perspective – a perspective that proves to have a central place in the actual philosophical reorientations in philosophy of science. I will try to identify some broad lines that an approach on understanding through models has to follow in order to constitute a plausible attempt.

Scientific understanding in philosophy of science – some milestones

As noticed, the topic of scientific understanding has been a rather neglected subject in philosophy of science despite its association with the well-known topic of scientific explanation. The main reasons for this neglect could be found primarily in the anti-psychologist attitude which marked the classical conception of neopozitivism that set the agenda in the field. A direct formulation of this attitude can be found in Hempel's work on explanation: "such expressions, such as a 'realm of understanding' and 'comprehensible' do not belong to the vocabulary of logic, for they refer to psychological or pragmatic aspects of explanation"[2]. These aspects were considered by the neopositivists to belong to the context of discovery and not to the one of justification[3].

Hempel also distinguishes a "theoretical or cognitive sense of understanding" that is provided by explanations by "exhibiting the phenolmenon to be explained as a special case of some general regularity[4]". In another well-known characterization, Hempels states that an explanation gives us understanding by showing that the occurrence of the phenomenon to be explained "was to be expected" but he does not argue that this lawlike expectability would be sufficient for understanding. Besides these scattered claims, there is no attempt to analyze understanding anywhere in his work. This reticence is backed and driven by the conviction that such aspects are only psychological by-products of explanation.

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[2] Carl G. Hempel, "Aspects of Scientific Explanation", in *Aspects of Scientific Explanation and other Essays in the Philosophy of Science*, Free Press, New York, 1970, p. 413.

[3] The distinction was intended by Reichenbach to delineate the proper domain of logical-philosophical analysis from other aspects that fall outside the scope of such an analysis such as the psychological, sociological or historical factors.

[4] Carl G. Hempel, *op. cit.*, p. 257

In the frame of the explanation debate, Michael Friedman[5] was the author that argued for a reconsideration of understanding for a philosophical approach. By distinguishing the subjective part of pragmatics i.e. the one that refers to personal psychological factors from the objective one that refers to rational beliefs and attitudes of more persons, he sees no impediment in giving understanding a place in the philosophical analysis of explanation. According to Friedman, an account of explanation should capture the objective aspect of understanding by isolating a specific propriety of the explanatory relation that is independent of historical variations and has a demonstrable connection with understanding. This propriety is one of unification. In his words "science increases our understanding [...] by reducing the total number of independent phenomena that we have to accept as ultimate or given[6]" and thus unifying the corpus of our knowledge. The reduction process involves the derivation of the phenomena expressed through general regularities (previously, independently accepted) from more comprehensive laws. For an illustration we can consider the case of the derivation of some specific physical laws, such as: Kepler's law, Galileo's laws and the laws of kinetic theory of gases, from the general laws of Newtonian mechanics.

Through his account Friedman initiates the unification approach to scientific explanation and also sets two major characteristics that will mark the view on scientific understanding. The first major one is the global character that he attributes to understanding. In his words understanding is a "global affair[7]", meaning that it doesn't concern isolated facts or events but the unification of a multitude of phenomena. It involves integration of phenomena in a larger corpus. Adherents of the unificationist view on explanation will articulate this integration in different accounts: either through explanatory patterns as in Kitcher's account[8] or through relations between sets of models as in Bartelborth's account[9].

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[5] Michael Friedman, "Explanation and Scientific Understanding", in *The Journal of Philosophy*, 71 (1), 1974, pp. 5-19.

[6] Michael Friedman, *op. cit.*, p. 15.

[7] Michael Friedman, *op. cit.*, p. 19.

The global type of understanding is also mentioned by W. Salmon[10] who sees it expressed through entire scientific world-pictures (Weldanschauung) – synthetic pictures of the world that science provide us. Such is for example the great Newtonian synthesis built on the Newtonian physical theory. Nevertheless, W. Salmon also makes room for another type of understanding directed towards natural phenomena – the one through causal mechanisms. It is the product of a causal explanation and is given by "opening the black boxes of nature". This type of explanation is the one articulated by his account on explanation. Salmon adopts in this way a pluralistic point of view, admitting different types of understanding. He appears this way to adopt a unique position during that period.

The second major characteristic set by Friedman is the closer link between understanding and explanation. In Friedman's view an account on explanation should also tell us what understanding is and how it is reached. Approaching understanding is possible only through an approach on explanation and not in a direct way, making it therefore a sort of a by-product of an account on explanation. In his words: "It is not reasonable to require that a theory of explanation proceed by first defining 'scientific understanding' and then showing how its reconstruction of the explanation relation produces scientific understanding. We can find out what scientific understanding consists of only by finding out what scientific explanation is and vice versa[11]".

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[8] Kitcher states that "science advances our understanding of nature by showing us how to derive descriptions of many phenomena, using the same patterns of derivation again and again", in Philip Kitcher, "Explanatory unification", in *Philosophy of Science* 48 (4), 1981, p. 212.

[9] He develops his account in the frame of the structuralist approach on theories – a variant of the semantic view on scientific theories – as developed by Wolfgang Balzer, C.U. Moulines, Joseph Sneed, *An Architectonic for Science: The Structuralist Program*, Dordrecht, Reidel, 1987.

[10] In his paper "The Importance of Scientific Understanding" republished in the volume Salmon, Wesley C., in *Causality and Explanation*, Oxford University Press, Oxford, 1998.

[11] Michael Friedman, *op. cit.*, p. 6.

This requirement was tacitly adopted by the authors addressing the explanation topic (belonging also to other type of approach than explanation as unification). It was somehow implicitly that their explication of explanation also provides an insight on understanding. In this way there was no need any more to deal with it independently. Only two decades later can one find authors that articulate a direct approach on understanding. Such is for example Schurz's account[12] that still retains the global feature of understandding and still connects it to explanation but the last one becomes derivable from his conception on understanding. A more recent direct account was proposed by de Regt and Dieks[13] that articulates a pragmatic conception of understanding in which the main idea boils down to the ability in order to draw qualitative inferences without performing detailed computations.

We cannot end this section by not mentioning a powerful skeptical reaction towards any sort of philosophical approach on understanding. This reaction was articulated by J.D. Trout from a naturalistic position drawing on research from cognitive psychology. Trout[14] accuses the philosophical approaches to draw on a wrong sense of understanding. Trout noticed that when scientists piece together phenomena, they do so by focusing on the detailed findings of their (usually) narrow specialization. Meanwhile "when philosophers piece together a global explanation, they look to the subjective sense of fit as a cue for an acceptable explanation[15]". This subjective sense originates in two psychological biases that are well documented in psychological studies: hindsight and overconfidence. So the philosophical theories that rely on the sense of understanding, such as a criterion for judging the goodness of an explanation are totally wrong.

De Regt tried to defend a philosophical approach on understanding. It still remains open to the degree it managed to dissolve any skepticism. Anyway, the problem of separating a genuine type of understanding from a fake one was also addressed by other authors, such as Ylikosky[16] or Kuorikoski[17]. It became this way an open issue on the working agenda of the topic.

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[12] Gerhard Schurz, Karel Lambert, "Outline of a theory of scientific understanding", in *Synthese*, 101 (1), 1994, pp. 65-120.

[13] Henk W. de Regt, Dennis Dieks, "A Contextual Approach to Scientific Understanding", in *Synthese*, 144 (1), 2005, pp. 137-170.

[14] J. D. Trout, "Scientific explanation and the sense of understanding", in *Philosophy of Science*, 69 (2), 2002, pp. 212-233.

[15] J. D.Trout, "Scientific explanation and the sense of understanding", p. 220.

Tackling understanding through models

How might the understanding provided by models be accounted for? We can first try to see in what regard the already existing approaches have fared in their attempt to illuminate understanding through scientific models.

In the following paragraphs I will briefly go through the accounts mentioned above and evaluate them in regard to the issue of model-based understanding. Hempel's account seems to be totally centered on laws. In this sense if a model contains laws and explanatory accounts for the occurrence of a phenomenon the merit goes to the laws. One might restrain the meaning of a model to strictly point out the law and the conditions of its application in order to mimic Hempel's schema. But there is usually more to a model when a scientist builds or applies one. Models essentially contain different assumptions, idealizations and simplifications that enter in the corpus of the model and make out its content and are not reducible to laws or the description of the boundary conditions. Therefore Hempel's account is a too schematic way of approaching explanation and understanding through models.

Friedman's deductive reduction among laws can also be part of the content of a model. There are in fact theoretical models that have the purpose to advance such derivation of different laws. This is undertaken in the framework of a law; we will need more such models in order to account for the idea of multiple specialized laws subsumed under a fundamental one. Friedman's reductive unification makes proper sense in the framework of a theory and less of a model.

Something similar happens when we consider Salmon's types of understanding: through worldviews and through causal mechanisms. Though we might refer to a sketchy worldview as a model for the entire reality, this is only in an improper way. What Salmon points to when referring to a Weltanschauung is rather the picture emerging from the fundamental theories of science that we accept at a given historical period. On the other side, when we talk of models, we are concerned with representation of specific phenomena. The second type of understanding, the one given through causal mechanisms becomes relevant in this case. Such a causal mechanism can be seen as the structure of a specific type of model – a causal one.

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[16] Petri Ylikoski, "The illusion of depth of understanding in science", in *Scientific understanding: philosophical perspectives*, Henk de Regt, Sabina Leonelli, and Kai Eigner (eds.), University of Pittsburgh Press, Pittsburgh, 2009, pp. 43-63.

[17] Jaakko Kuorikoski, "Simulation and the Sense of Understanding", http://philsci-archive.pitt.edu/4480/. 2009.

What seems to go wrong in all the above attempts to apply the old accounts to models is the fact that we do not capture the specificity of models as scientific constructs. There is a mismatch which is grounded in the tension between the local and the global character of the items investigated. I have already emphasized the global characteristic that understanding is supposed to exhibit according to the classical conception. This conflicts with the local character of models.

There are more ways in which we can make the local character of models more explicit. First is the range of application. Models are scientific constructs that are more delimited in range and scope than the traditional constructs of theories or laws. They usually target specific phenomena or some more particular aspects of such phenomena. To take two examples from physics – the ideal gas model, which holds in the range of high temperatures and low pressure; or the Bohr model of atoms holds just or simple atoms, such as the hydrogen atom. In order to apply such models to a larger range we have to modify them into new sorts of models e.g. the van de Waals equation for real gases. Physicists might construct specific models to account for particular gases of systems that can be described by using a similar formalism. Scientists have used such models to advance some new representation of a phenomenon and to explore their theoretical potential. Simplifications and idealization on which models are built impose the needed restrictions on models mainly to enhance tractability. If we take into consideration other types of models (for example material models) we can see specific aspects of a phenomenon that such models target. A car model in a wind-tunnel is meant to gather information on the best aerodynamic form which decreases the air resistance of the moving car.

The local character of the model is also reflected through the fact that they are constructs, more influenced by pragmatics than theories or laws. Models are more sensitive to the context of inquiry. It is a construct endowed by the scientist with some purpose. According to the philosopher R. Giere[18] the relation of representation between model and reality is best rendered though a many-placed relationship than a binary relation. Purposes are embedded in the design of a model. Giere explicitly makes such a model-based representation by defining it as "*S* uses *X* to represent *W* for purposes *P*[19]". Where *S* is the scientist, X is the model and W is an aspect of the real world. Recently, the relativity towards the scientists is emphasized by another author, John Simpson. Simpson[20] argues that models (and simulations) are entirely observer's relative: "models and simulations are what they are because of how we see and use them[21]". Of course this position, if taken too unqualified, needs to be answered in regard to different issues that it raises.

This character has to be reflected in the way models give us understanding. The unification and coherence realized by understanding have to be qualified accordingly. We have to take into considerationa sort of more local unification, a more restricted one than the global type advocated in the classical approach. The integration would not range unrestricted over entire scientific fields, disciplines or corpuses of knowledge. When it comes to constructing a model only some selected information is integrated, and this selection is mainly determined by contextual factors. Such are the type of representations we use that determine what sort of idealizations and simplifycations are involved according to the purpose for which we build the model.

Towards a pluralistic view on understanding

One of the most striking aspects that confront any approach on models is the variety of the types of models. Models can take many forms, from mathematical equations to scale models, form schematic diagrams to organisms. The variety of models is given through the diversity of their nature but also of the functions for which they are built and deployed. The purposes of these models, as well as the functions they are supposed to fulfill, cover a large spectrum. First of all we have in mind the explanatory aims, but there are many more other models built for different purposes. To mention only a few context models are involved in, we can point to articulating a possible explanation, to explore the explanatory potential of some theoretical structures, to test prospective theories or hypothesis, to predict or generate new data etc. This variety has an inevitable impact on the way we might approach the issue of understanding.

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[18] Ronald N. Giere, "How models are used to represent reality", in *Philosophy of Science*, 71 (5), 2004, pp. 742-752.

[19] Ronald N. Giere, *How models are used to represent reality*, p. 742.

[20] John Simpson, "Identity Crisis: Simulations and Models", in *Simulation & Gaming*, 42 (2), 2011, pp. 195-211.

[21] John Simpson, "Identity Crisis: Simulations and Models", p. 196.

The second feature that we identified as characteristic for the classical approach on understanding that required a strong connection between explanation and understanding restricts any investigation to the sort of explanatory understanding – the understanding provided through explanations. This would unreasonably restrain the approach to understanding that builds up only in explanatory modeling contexts. The diversity of models forces upon the philosopher the need to take the possibility of a plurality of types of understanding seriously.

In fact as we saw the need for a pluralistic view, it was expressed by W. Salmon when accepting the different sorts; one through unification and one through causal mechanism. Both are claimed through the articulation of some accounts on explanation, fulfilling Friedman's requirement. Salmon got even one step further and made room in his typology for kinds of understanding that were not provided through explanation of natural phenomena. Such was the understanding of meaning or of human emotions (through empathy).

As already mentioned in the first section a radical step of departure from this requirement could be seen only in some recent developments that explicitly proposed direct accounts of understanding that are not analysis of explanations. Such is the account advanced by Lambert and Schurz that takes the unification intuition, the core feature of an understanding, and remains this way in the shadow of the unificationist view on explanation. The other account by de Regt and Dieks brings us one step further in decoupling explanation from understanding, though their intention is directed towards explanatory understanding. By making essential reference to contextual determination it opens the possibility of adopting a pluralistic view on understanding.

The two proposals are meant to be general accounts that explicate understanding of any sort, as provided in any explanatory context.

Nevertheless Lambert and Schurz are too connected to the unificationist approach and subjected to the critiques that were formulated towards it. As Gijsbers[22] argued with reference to Kitcher's and Lambert-Schurz's accounts we might have explanations and understanding that are rather disunifying than unifying. According to the author, it is not necessary that an explanation should contribute to the global unification; it can contribute to a local sort of unification, establish only a local coherence and be disunifying at a global level. In what regards the analysis of de Regt and Dieks, I also noticed previously that it targets quite a particular form of understanding[23]. It suggested this way the need to also address other types of understanding differences from theirs.

Another bold reason for adopting a pluralistic perspective on understanding comes from the way we might take into account the cognitive benefits that an understanding might bring. In a recent paper[24] Peter Lipton shows convincingly that there are more cognitive benefits associated with understanding that can be obtained without explanation. For Lipton "understanding is more extensive and more varied in its sources than those who would equate explanation with understanding allow[25]". He identifies four types of benefits that we can obtain without explanations: causal information, that we can get through observation, experimentation, manipulation or inference, a sense of necessity provided through the fact that the process could not have been otherwise, a sense of what is possible that can come from potential or even false explanations and the unification obtained by comparing phenomena through analogies and classification.

The above discussed benefits could be for sure realized in the framework of different non-explanatory types of models. Such models would be built with the main purpose to enhance the sort of understanding that provides specific cognitive benefit. These benefits could also be obtained through other means without necessarily making reference to models. In case of causal information Lipton mentions, apart from models, direct manipulations or even images. Though, it might be in many cases that such means are more or less embedded in a modeling context. Besides, the great advantage of invoking a modelistic framework is that we do have some clear reference units that fix our investigation and ground it better into the scientific practice.

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[22] Victor Gijsbers, "Why unification is neither necessary nor sufficient for explanation", in *Philosophy of Science*, 74 (4), 2007, pp. 481-500.

[23] As I showed in my doctoral thesis and some similar observation can be found more recently in Daniel A Wilkenfeld, "Understanding as representation manipulability", in *Synthese*, http://www.springerlink.com/content/g76p2473r4377366/, 2011.

[24] Peter Lipton, "Understanding without Explanation", in *Scientific understanding: philosophical perspectives*, Henk Regt, Sabina Leonelli, and Kai Eigner (eds.), University of Pittsburgh Press, Pittsburgh, 2009, pp. 43-63.

[25] Peter Lipton, "Understanding without Explanation", p. 44.

If we regard the enumerated benefits we could quite clearly make the reference to a model. We indeed get the feeling for a causal connection by engaging in manipulation of a material model, for example. In a similar way the sense of necessity that can come from, according to Lipton, arguments thatare not explanation but which can constitute the backbone of a model. Thought experiments are brought as illustration by Lipton for such arguments which might quite nicely count as models. The sense of possibility gained through potential explanation would even better illustrate the reference to models; in fact the very meaning of a model is seen as such a potential, exploratory explanation.

So we might conclude that adopting a pluralistic view in the investigation of model-based understanding has proven to be a necessary step in the actual state of the research.

Conclusions

In order to wrap up my discussion I'll mark the main points and morals that were extracted. I began my discussion with a historical overview of how understanding was approached in philosophy of science. The negative attitude towards it induced a sort of prohibition when it came to addressing the issue. Friedman was the philosopher that argued for a reconsideration of understandding in the framework of an approach on explanation. He also advanced two requirements that marked the way understanding was considered to be approachable: the global character of understanding and its close connection to explanation. This meant that any insight into what understanding is, has to be provided through an explication of explanation.

In the second part I tried to see how understanding in a modeling context could be approached by making use of the already existing accounts on explanation and understanding. At the origin of the inadequacies I pointed to the tension between the global character of the classical concept of understanding and the local character of the modeling aspects. In order to tackle understanding though models, the unifying propriety of understanding has to be rescaled; in this sense we might consider local unification as specific for understanding in modeling contexts.

In the third part I discussed the implications for understanding the variety of models and modeling formats. This has a direct impact on the Friedman requirement of the identity between the analysis of explanation and understanding. Explanatory understanding i.e. understanding built through explanations is only one species of understanding. The modeling perspective brings with it the necessity to account for other types of understanding that fall under the non-explanatory species. The multiple cognitive benefits that understanding might exhibit without explanation pushes us further in the direction of adopting a pluralistic perspective.

Overall we might say that the topic of scientific understanding, though still in its beginnings, brings with it a rich spectrum of issues that reveals interesting research opportunities for the philosopher of science.

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How to Manage a Π_1-sentence

Virgil DRĂGHICI

ABSTRACT: The Π_1-sentences played an important role both in Gödel's incompleteness theorems and in Hilbert Program. The present paper is an analysis of the behavior of a Π_1-sentence, the Gödel's undecidable sentence G, in the context of arguing its *truth*. It is focused on stressing the difference between the truth and proof, by arguing *why* this sentence is not provable in Peano Arithmetic, *how* we can recognize its truth and what the consequences of a careless handling of it are.

KEYWORDS: *Σ_1- and Π_1-sentences, Gödel's theorems, diagonalization, reflection principles, soundness, Wittgenstein, paraconsistency*

Preliminary: Σ- and Π-formulas

Let *PA* be the acronym for a system of the first-order in Peano Arithmetic. The class Σ_0 of *PA*-formulas is defined inductively as follows: it contains the Σ_0-atomic formulas (i.e. formulas of the form $t_1 + t_2 = t_3$, $t_1 \cdot t_2 = t_3$, $t_1 = t_2$ or $t_1 \leq t_2$, where t_1, t_2 and t_3 is either a variable or a numeral), $\neg\alpha$, $\alpha \circ \beta$, where "$\circ$" denotes any binary connective of propositional logic, $\forall x < t\alpha$ and $\exists x < t\alpha$, where α, β and t is a variable or a numeral different from x. In a Σ_0-formula, all quantifiers are bounded.

A Σ_1-formula is a formula of the form $\exists x_n \alpha(x_1,\ldots,x_n)$, where $\alpha(x_1,\ldots,x_n)$ is a Σ_0-formula. A Σ_1-formula begins with one unbounded existential quantifier, all the others being bounded.

A Σ-formula may contain any number of unbounded existential quantifiers, but all universal quantifiers are bounded.

A relation is called a Σ-relation if it is expressed by a Σ-formula.[1]

A formula without free variables is a closed formula or sentences.

As it can easily be observed, the class of Σ_0-sentences is a class of *decidable* formulas.

A Π_1-formula is a formula of the form $\forall x\alpha$, where α is a Σ_0 $(=\Pi_0)$ formula. If it does not contain any free variable, then it is a Π_1-sentence[2].

Hence, Σ_1- and Π_1-sentences have the form $\exists x\alpha(x)$ and $\forall x\alpha(x)$, where $\alpha(x)$ is a Σ_0- or decidable formula of *PA*.

Lemma. *PA is Σ_1-complete.*

I.e. any true Σ_1-sentence is provable in *PA*. For if we suppose that the Σ_1-sentence $\exists x\alpha(x)$ is true, it follows that there is a natural number *n* such that the arithmetical sentence $\alpha(n)$ is true. So the Σ_0-sentence $\alpha(\boldsymbol{n})$ is provable in *PA*, hence $PA \vdash \exists x\alpha(x)$, by existential generalization.

The above result is a key fact about Σ_1-sentences of *PA* and can be considered a *special* result of the completeness theorem for *PA*. But only a "special" one, for there is some truths not provable in *PA*. This is the case for the celebrated Gödel sentence G. In order to set matters up, we need to review the structure and proof of such a sentence.

Gödelian Π_1-sentence G

In his 1931 paper[3] Gödel defined the following recursive relation:

$$Q(x,y) \equiv \overline{xB[\delta(y)]}$$

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[1] Σ-relations do coincide with Σ_1-relations, also called *recursively enumerable*. Σ_0-relations are also called *constructive arithmetic* relations.

[2] Σ_1- and Π_1-formulas with free variables can have the form $\exists x\alpha(x,y)$ and $\forall x\alpha(x,y)$ respectively.

[3] K. Gödel, "Über formal unentscheidbare Sätze der Principia mathematica und verwandter Systeme I", in *Monatshefte für Mathematik und Physik*, 38, 1931, pp. 173-198.

where xBy is the proof relation whose meaning is "x which is (the Gödel number of) a proof of (the formula with Gödel number) y"[4]. $\delta(y)$ is the Gödel number of the diagonalization of the formula with the Gödel number y. I.e. if $\alpha(x)$ is a formula containing x free and its Gödel number is n, then $\alpha(\boldsymbol{n})$ is the diagonalization of $\alpha(x)$; in other words, the diagonalization of a formula $\alpha(x)$ is a formula obtained by substituting the numeral for its Gödel number for the free variable x. If n is the Gödel number of $\alpha(x)$, $\delta(n)$ will be the Gödel number of its diagonalization. If $\delta(y)$ is set in brackets then the respective expression denotes the formula whose Gödel number is $\delta(y)$. The line above denotes the intuitive negation[5]. So the meaning of $Q(x,y)$ is: "x *which* is not a proof of $\delta(y)$". Since $\delta(y)$ is a recursive function and xBy is a recursive relation, and the negation of a recursive relation is a recursive relation, $Q(x,y)$ is a recursive relation. Therefore it is *expressible* in *PA*, that is, there is a formula of *PA* [q(x,y)] such that:

1. If $\overline{xB[\delta(y)]}$, then $\vdash$ [q($\boldsymbol{x}$,$\boldsymbol{y}$)].
2. If $xB[\delta(y)]$, then $\vdash$ [¬q($\boldsymbol{x}$,$\boldsymbol{y}$)].

Let $p = 17\ Gen\ q$. Gödel's refers to the formulas by using their corresponding Gödel numbers.[6] In our notation the respective formula is just [∀xq(x,y)]. Since q(x,y) expresses formally $Q(x,y)$, in *PA*, the intuitive meaning of this formula is: "for all x, x is not a proof of the diagonalization of y" or equivalently: "the diagonalization of y is not provable". So p is just the Gödel number of this formula [∀xq(x,y)]. Let r be the Gödel number of the formula [q(x,$\boldsymbol{p}$)], whose intuitive meaning is: "x is not a proof of the diagonalization of p". Let now 17*Gen* r be the Gödel number of the formula

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[4] The relation xBy is used then to define the provability predicate for *PA*, *Bew*(y), in the following way: *Bew*(y)≡∃x*xBy*, that is "(the formula with Gödel number) y is provable".

[5] The symbols (x), (*Ex*), $\overline{}$ are *intuitive* symbols for universal quantification, existential quantification and negation; in contrast to *formal* ones: ∀x, ∃x and ¬. Note the difference between intuitive variables x, y, z and the formal variables x, y, z.

[6] q is a relation sign with the free variables 17 and 19 and 17*Genq* means the universal quantification with respect to the first variable x.

$[\forall xq(x,p)]$, whose intuitive meaning is: "for all x, x is not a proof of the diagonalization of the formula (with the Gödel number) p". But the diagonalization of p is just this formula, $[\forall xq(x,p)]$. So this formula is *self-referential, asserting its own unprovability*[7].

Now, from 1 and 2 above we get:

1*. If $\overline{xB[\delta(p)]}$, then $\vdash [q(x,p)]$.

2*. If $xB[\delta(p)]$, then $\vdash [\neg q(x,p)]$

where $\delta(p)$ is the Gödel number of the Gödelian sentence $[\forall xq(x,p)]$.

Gödel's Theorem. *If PA is ω-consistent, then neither* G *nor* ¬G *is PA-provable.*[8]

We review the Gödel's proof.

1. G: $[\forall xq(x,p)]$ is not *PA*-provable.

Reductio. Suppose that G is provable. By the definition of *Bew*(*y*) it follows that there is an n, such that $nB[\forall xq(x,p)]$. By 2* we obtain $\vdash [\neg q(x,p)]$, whereas, on the other hand, from the assumption of *PA* provability of G follows that $\vdash [q(x,p)]$. So *PA* is inconsistent.

2. $[\neg\forall xq(x,p)]$ is not *PA*-provable.

By 1, G is not *PA*-provable. So by the definition of *Bew*(*y*), there is no n that would be the Gödel number of a proof of G, i.e. $\overline{(n)nB[\neg\forall xq(x,p)]}$. By 1* it follows that for any n holds: $\vdash [q(n,p)]$. But this fact together with the assumption of ¬G contradicts the ω-consistency of *PA*.[9]

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[7] Or the remarkable Π_1-sentence G.

[8] This is the content of his *Theorem VI*. Properly, for the proof of G only the simple consistency is required.

[9] According to Gödel this proof is *constructive*, hence "unobjectionable from the intuitionistic point of view" (cf. Gödel, 1931, fn 45a).

How do we recognize that G is true?

A limitative result prevents us from using a truth predicate *inside PA*. For by the *diagonalization lemma* for any formula of *PA* $\alpha(x)$, with x free, there is a sentence S of *PA* such that $PA \vdash S \equiv \alpha(\ulcorner S \urcorner)$, where $\ulcorner S \urcorner$ is the numeral for the Gödel number of *S*. Now, a truth predicate Tr(x) must satisfy the equivalence $S \equiv Tr(\ulcorner S \urcorner)$, for any S. But if we consider the formula $\neg Tr(x)$, then by diagonalization lemma the equivalence $S \equiv \neg Tr(\ulcorner S \urcorner)$ is *PA*-provable. So the inconsistency $Tr(\ulcorner S \urcorner) \equiv \neg Tr(\ulcorner S \urcorner)$ is *PA*-provable. This is the limitation imposed by Tarski's theorem: *the concept of truth is not definable in PA*[10].

So in order to grasp the truth of G in the standard model *M* of *PA*, we have to inspect its structure, rendered by the exposition in the preceding section. As we saw, the formula [q(x,y)] expresses in *PA* the intuitive relation $Q(x,y)$, hence the closed formula G states intuitively that $Q(x,p)$ is false for any *x*, that is the diagonalization of the formula with Gödel number *p* is not provable. So G says about itself that it is not provable in *PA*. But by Gödel's proof, 1, if *PA* is consistent, then G is actually unprovable. So G is *true* in the standard model *M*.

According to the above Tarski's limitative result, this argument concerning the truth of G cannot be carried out in *PA*. So it is a metamathematical one.

Therefore, the recognition of the truth of G is based on an inspection of *the construction of* G *and some fundamental results from the recursion theory, e.g. the formal expressibility of recursive relations in PA*.

Can we really have a proof of G?

Let us critically draw up an inventory of three remarkable proposals concerning the provability of Gödel sentence G. As we shall see all are based, even if differently, on the same idea: the Π_1-Gödel sentence is provably true, assuming (correctly) the soundness of our arithmetical intuition.

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[10] A. Tarski [1936], "Der Wahrheitsbegriff in den formalisierten Sprachen", in *Studia Philosophia*, 1, 1936, 261-405; engl. transl. in Tarski [1956], pp. 152-278.

According to M. Dummett "[t]here is indeed something which leads us to recognize the statement [G] as true [...][11], based on the following considerations:

> The argument to establish the truth of [G] involves establishing the consistency of the formal system. The interest of Gödel's theorem lies in its applicability to *any* intuitively correct system for number theory. [...] We have, therefore, to consider the consistency proof with which Gödel's reasoning must be supplemented if the truth of [G] is to be established as one which we know that we can give for any formal system, provided only that it is assumed about that system that it is intuitively correct[12].

I gave this passage from Dummett for it is the lait motif of many other points of view on these matters. From these quotation results that are only on *the assumption* of consistency of *PA*, the truth of G can be derived.

But can we actually have a proof of *PA*-consistency? Dummett agrees that such a proof can be given on the assumption of the soundness of *PA*. I.e. through induction on the length of the proofs, assuming that the axioms of *PA* are true and the inference rules preserve the truth, we conclude that all theorems are true. Their negations being false, are not provable in *PA*. So *PA* is consistent[13].

So, the truth of Gödel sentence G can be recognized, *via* Gödel's theorem, *under the assumption of consistency of PA*, that can be discharged only by assuming the soundness of *PA*.[14] In other words, the truth of G is based, on this view, on the *confidence in our arithmetical intuition. Stricto sensu*, what Gödel's theorem proves is a conditional: *If PA is consistent, then G is not provable*. This incompleteness result does imply some kind of *vagueness* of the notion of a "natural number", called by the author "indefinite extensibility[15]". Hence, we do not really have a proof of G.

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[11] M. Dummett, "The Philosophical Significance of Gödel's Theorem", in M. Dummett, *Truth and Other Enigmas*, Duckworth, London, 1978, p. 192.

[12] M. Dummett, *op. cit.*, p. 194.

[13] M. Dummett himself considers that such a proof cannot be "genuinely informative" (*op. cit.*, p. 194).

[14] At this issue of the assumption of *consistency* or *soundness* we come back in the next section.

[15] M. Dummett: "for any definite characterization of it, there is a natural extension of this characterization, which yields a more inclusive concept" (*op. cit.*, p. 195).

The same appeal to confidence in our intuitive arithmetical understanding appears more prominently in Penrose's papers[16]. Human intuitive understanding, even in the realm of mathematics, surpasses any algorithm: "[...] *whatever*... algorithm a mathematician might use to establish mathematical truth [...] there will always be mathematical propositions, such as the explicit Gödel proposition that his algorithm cannot provide an answer for[17]". So our intuition allows us to see the truth of Gödel's sentence G. Hence we have a proof of G[18], for our informal (intuitive) concept of proof; it is different from that of a formal system or of an algorithm of the Turing machines. Is our intuition so infallible in order to warrant that we really have a proof of G? We answer this question in the next sections.

The same disanalogy between informal and formal proofs can be found in Priest's dialetheism[19], in the form of the distinction between naïve proof and formal proof. In order to have a proof of the Gödel sentence G in *PA* we have to show that *PA* is sound and "this is possible by a simple induction over the length of proofs in [*PA*][20]", exactly in Dummett's sense mentioned above. But the aim in this case is very different. Priest uses Gödel's theorem in order to argue for the existence of dialethias: the sentences are both true and false. And this can be proven by an application of Gödel's result to an informal (naïve) notion of proof "in such a way as to show it to be inconsistent[21]". We are not interested in this paper in dialetheism, but in the idea whether we really have a proof of G. In the section below we argue that this is not the case.

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[16] R. Penrose, *The Emperor's New Mind*, Oxford UP, 1989, p. 538; ***, *Shadows of the Mind*, Oxford UP, 1994, section 2.5.

[17] R. Penrose, *The Emperor's New Mind*, Oxford UP, 1989, p. 538; ***, *Shadows of the Mind*, Oxford UP, 1994, section 2.5.

[18] For a critical exposition of this view, comp. V. Drăghici, 2011.

[19] Comp. G. Priest, *In Contradiction*, sec. ed. Oxford UP, 2006, Ch. 3.

[20] G. Priest, *op. cit.*, p. 49.

[21] G. Priest, *op. cit.*, p. 40.

Why we do not have a proof of G

The notion of proof is related to a formal system *S*. By a proof of formula α in *S* we understand a finite sequence of formulas in which any formula either is an axiom or a formula resulting from the applications of an inference rule to the preceding formulas of sequence, and the last formula of such a sequence is α. By Gödel's theorem, if the system *S*, say *PA*, is (ω)consistent, then G is not provable in *PA*. So inside of a consistent *PA*, a proof of G is not possible. By the same Gödel theorem, what is proved is the respective conditional: *If PA is consistent, then* G *is not PA-provable*. But this metamathematical sentence can be formalized in *PA*, for the antecedent of this conditional can be rendered formally by a formula Con_{PA} of the form $\neg\mathrm{Bew}(0=1)$. So the whole metamathematical sentence becomes $\mathrm{Con}_{PA}\supset G$, since "G is not provable" it is just G. $\mathrm{Con}_{PA}\supset G$ *is a sentence of PA*. Now, obviously, we would have a *proof* of G if we had a *proof* of the formula Con_{PA}. But by Gödel's second incompleteness theorem, if *PA* is consistent, then the formula expressing its consistency, Con_{PA}, is not provable in *PA*. So what we really have is only the respective conditional from Gödel's theorem, *not* a proof of G.

Are there other ways for proving G? According to Dummett's view, from the preceding section, a proof of *soundness* of *PA* would be sufficient in order to deduce that G is provable. But the inductive argument used to argue the soundness (present, even if with different force, in Dummett, Penrose and Priest) is essentially based on the very questionable assumption: the confidence in our *intuitive understanding* of the axioms of *PA* and its rules of inference. Again, a proof of G would exist if we had a *proof* of soundness of *PA*. Can we have such a proof? The answer is "no", and we confine ourselves to mention the main obstacles to such a proof.

A soundness property of a system is a sentence asserting that *any provable sentence in S is a true sentence of S*. Formally such a sentence can be translated in a variety of ways. We only mention two of them[22].

LRefl. $\mathrm{Bew}(\ulcorner\alpha\urcorner)\supset\alpha$, for every sentence α of *S*.

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[22] G. Kreisel; A. Lévy, "Reflection principles and their use for establishing the complexity of axiomatic systems", in *Zeitschrift für mathematische Logik und Grundlagen der Mathematik*, 14, 1968, pp. 97-142.

GRefl. Bew(⌜α⌝)⊃Tr(⌜α⌝), for every sentence α of *S*.

The first is the *local* reflection principle, and the second one is the global reflection principle. In their formulations Bew(x) is the formula expressing provability predicate, mentioned in section 1. In contrast to local, *GRefl* cannot be formulated in *PA*, for its expression requires a *truth* definition Tr(x), which by Tarski's theorem doesn't exist.

Now, the Π_1-sentences play an important role in Gödel's incompleteness theorems. By a fundamental result of proof theory[23] *consistency is equivalent to local reflection principle restricted to* Π_1*-sentences*; i.e. Con_{PA} equiv. LRefl_{Π_1}. From the unprovability of Con_{PA} inside of *PA* it follows the unprovability of soundness assertion for *PA* (restricted to Π_1-sentences). Since the soundness of *PA* cannot be proven, the assumption of soundness cannot be discharged, and hence we, again, do *not* have a proof of G.

The above argument, *mutatis mutandis*, can be applied against Penrose's view that by an informal proof we see that G is true[24]. At any attempt to formally define the soundness of a computational procedure, by using Second Recursion Theorem[25] a contradiction can be derived[26]. So, again, we do *not* have a proof of Gödel's Π_1-sentence G.

Concluding remarks

Π_1-sentences play an important role both in Gödel's incompleteness theorems and in Hilbert's Program[27]. A Π_1-sentence is a closed formula of the form $\forall x \alpha(x)$, where $\alpha(x)$ is decidable. With the same proviso, a Σ_1- formula has the form $\exists x\alpha(x)$. While all true Σ_1-sentences are *PA*-provable, not all true Π_1-sentence are *PA*-provable. The famous Gödelian Π_1-sentence G, asserting its own unprovability is such a sentence. So how do we manage such a sentence without breaking down its inconsistencies?

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[23] C. Smorynski, "The Incompleteness Theorems", in vol. J. Barwise (ed.), *Handbook of Mathematical Logic*, North-Holland Publ. Co., 1977. Theorem 4.1.4.

[24] Properly, Penrose considers Gödel's incompleteness theorem stated in terms of Turing machines computations; cf. Penrose, *Shadows of the Mind*, Oxford UP, 1994, pp. 74-75.

[25] S.C. Kleene, *Introduction to Metamathematics*, North-Holland Publishing Co., Amsterdam, 1964, § 66, pp. 352-353; M. Davis, *Computability and Unsolvability*, McGraw-Hill Book Company, Inc., New York, p. 176.

[26] The argument is formally very elaborated, we do not render it here.

[27] Since the proof of consistency of a system *S* is equivalent, on Hilbert's view, to the soundness proof for the "real" mathematics (i.e. the proof of soundness for Π_1-sentences).

Based on fundamental logic and mathematical facts we constructed arguments against the idea of the formal provability of G. Moreover, this does imply carefulness in operating with the truth related to the unprovable sentences like G, otherwise, *voluntary* or *not*, mistakes arise. I give some examples.

In arguing against the view that the human mind transcends computationally a Turing machine, Putnam[28] writes:

> Given an arbitrary machine *T*, all I can do is find a proposition *U* such that I can prove:
> (3) If *T* is consistent, *U* is true,
> where *U* is undecidable by *T* if *T* is in fact consistent. However, *T* can perfectly well prove (3) too!

I only note that the formulation of (3) contains a mistake. Since, according to Gödel's theorem, metamathematically what is proven is the conditional: *If T is consistent, then* G *is not provable*, and this assertion is *also* provable in *T* in its formal fashion: $Con_T \supset U$. But what (3) says is something different, for its formal expression is $Con_T \supset Tr(\ulcorner U \urcorner)$, and this formula contains a truth predicate, contra Tarski's theorem. Actually, if *T* is consistent, *T* cannot prove (3).

The same careless formulation does appear in Dummett's paper[29], where in a reference to Gödel's Π_1-sentence $\forall xA(x)$ he writes: "Considered as an argument to a hypothetical conclusion – that *if* the system is consistent, then $\forall xA(x)$ is true – this reasoning can of course be formalized in the system". Obviously, a rigorous formal rendering of this conditional, as above, would contain a truth predicate.

But there are some other points of view on which the idea of provability of Gödel's sentence G in a system *S* (contra Gödel's theorem) is

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[28] H. Putnam, "Minds and Machines", in *Philosophical Papers* 2, Cambridge UP, 1975, p. 366.

[29] M. Dummett, *op. cit.*, p. 192.

deliberately assumed. I mention only two of them intimately connected, I think, by their consequences.

On Wittgenstein's view, the meaning of an expression is determined by its use. Particularly, the meaning of a mathematical sentence is determined by the rules that govern its use in a formal system (i.e. by its proof in the system). So a proof of incompleteness *in a formal system* means an incompleteness of meaning. "The edifice of rules must be complete [...]" and "only the group of rules defines the sense of our signs, and any alteration (e.g. supplementation) of the rules means an alteration of the sense[30]". Therefore, "[m]athematics cannot be incomplete, any more than a sense can be incomplete[31]". It is easy to see the consequence of the assertion of *PA*-completeness: Gödel's sentence G is provable in *PA*, so it becomes a *paradoxical* sentence, an example of an undecidable sentence of *PA* decidable in *PA*[32].

As it can easily be seen, Wittgenstein's view is a result of his rejection of *meta*-mathematics and on the identification of truth with provability in a formal system[33].

These Wittgenstein's considerations, in a more elaborated form, can be found in a *paraconsistent* fashion. On this view, the aim of a formal proof is to establish the *truth* of a sentence. So the proofs are not strictly syntactic derivations. Hence by applying Gödel's theorem, we can (naïvely) prove the truth of Gödel's sentence G, a route with the same result as Wittgenstein's remark: G *is a paradoxical sentence*. In Priest's account[34],

> [...] in this context the Gödel sentence becomes a recognizably paradoxical sentence. In informal terms, the paradox is this. Consider the sentence, 'This sentence is not provably true'. Suppose the sentence is false. Then it is probably true and hence true. By *reductio* it is true. Moreover, we have

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[30] L. Wittgenstein, *Philosophische Bemerkungen* (*Philosophical Remarks*), Basil Blackwell, Oxford, 1964, p. 182.

[31] *Idem*., p. 188.

[32] Wittgenstein, L., *Bemerkungen über die Grundlagen der Mathematik/ Remarks on the Foundations of Mathematics*; in vol. P. Benacerraf, H. Putnam, 1956 § 11.

[33] An elegant critique of Wittgenstein's view is in Shanker, 1988 and Rodych, 1999.

[34] G. Priest, *In Contradiction*, sec. ed. Oxford UP, 2006.

> just proven this. Hence it is probably true. And since it is true, it is not probably true. Contradiction[35].

The source of this paradoxicality is the same as above: the bringing together of *proof* and *truth*. The result is a theory "*essentially*" inconsistent, in which all semantic paradoxes can be proven and which can prove its own soundness.

I do not develop this subject here. I only remark, finally, that if we want to avoid inconsistencies of any kind, both at a mathematical level and a metamathematical one, we must preserve the distinction between the *syntactical* concept of provability and the *semantic* concept of truth as well as that between a theory and a metatheory. The analysis of the behavior of a particular Π_1-sentence, Gödel's sentence G, shows us how this is possible.

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[35] G. Priest, *op. cit.*, p. 46.

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*** *Philosophische Bemerkungen* (*Philosophical Remarks*), Basil Blackwell, Oxford 1964.

Reflections on Art in Nichifor Crainic's View

Gabriel HASMAȚUCHI

ABSTRACT. In the interwar period the reflections on art have been the subject of many researches. In general, philosophers who have meditated upon the origin of the artistic beauty sustained its autonomy. In contrast, there were also thinkers who considered art in relation to religion. Of the last ones, the theologian and philosopher Nichifor Crainic (1889-1972), through his views, emphasised the fact that "beauty" and art have an undeniable theological meaning.

KEYWORDS: *art, autonomous, theological meaning, beauty, sofianic*

The Christian way of thinking, the idea of life, were the source of inspiration for a number of philosophers. The thinker on which we focus is Crainic, an aesthetician which plays a very special role in Romanian and European culture, because he gave a *theological meaning* to beauty in works of art.

The aesthetic concerns were a constant for the interwar thinkers, and the solutions were very different. Many of these concepts are presented in detail by the two authors of that period: Nicolae Bagdasar and Tudor Vianu, the first in the *Istoria filosofiei româneşti*[1] and the second in *Gândirea estetică*[2]. Out of their work comes the clear idea that the views on issues of aesthetics came from literary criticism to philosophy, or vice versa, and they focused on creation and its value but also on morals.

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[1] See Nicolae Bagdasar, *Istoria filosofiei româneşti*, Editura Profile, Bucureşti, 2003.

[2] See Tudor Vianu, *Gîndirea estetică*, Editura Minerva, Bucureşti, 1986.

Exchanging ideas on aesthetics in the culture of a society, especially the Romanian one, involved in the debate a number of authors, such as N. Iorga, C. Dobrogeanu-Gherea, P. P. Negulescu, G. Călinescu, Oskar Walter Cisek, A. C. Cuza, Al. Dima, Pompiliu Constantinescu, Petru Comarnescu, Dan Botta, Marin Simionescu Râmniceanu, Nichifor Crainic, Panait Cerna, G. Ibrăileanu, D. Tomescu, E. Lovinescu, H. Sanielevici, Paul Zarifopol, D. Caracostea, M. Simionescu-Râmniceanu, M. Ralea, G. M. Cantacuzino, Francisc Șirato, D. Cuclin, Eugeniu Speranția, Ștefan Nenițescu, Vasile Pârvan, Camil Petrescu, L. Blaga, Liviu Rusu, Mihail Dragomirescu, Tudor Vianu.

In addition to theories of the philosophers already mentioned, "also Mr. Crainic's considerations on *Sensul teologic al frumosului* (*Gândirea*, 1932), where is present the concept «Theological meaning of beauty» has to be taken into account, which recognizes the splendor of divine order[3]".

1. A new aesthetic vision. Crainic's contribution to Romanian aesthetic thinking made the subject of study for many scholars, even during the communist period. Among the studies that have real utility for us we mention those signed by G. Calinescu in *Istoria literaturii române de la origini până în prezent* (1940), by Alexandru Dima in *Gândirea românească în estetică*, by Gheorghe Epure in *Istoria filosofiei româneşti*, (vol. II, 1980), by Mihail Diaconescu in *Prelegeri de estetica ortodoxiei. I. Teologie şi estetică* (1996). We will also take into account the afterword written by Peter Ursache in *Nostalgia paradisului* (1996 edition), but also of the research entitled *Modul teandric şi relaţia dintre religie şi cultură la Nichifor Crainic* (2010), an article belonging to Constantin Stoenescu.

A theological idea on the aesthetic (of art) was, as stated by Alexandru Dima in 1943, more special than other guidelines: "We must recognize from the beginning, with Mr. Nichifor Crainic, that we go with her into a world unknown to the Romanian intellectuals, especially to our writers, which reflects all the currents of the universal thinking, apart from the religious that modern rationalism always denied[4]".

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[3] *Idem.*, p. 281.

[4] Al. Dima, *Gândirea românească în estetică. Aspecte contemporane*, Mircea Muthu (ed.), Editura Dacia, Cluj, 2003, p. 65.

Crainic's book, through which he definitely established as a philosopher of culture and art, is *Nostalgia Paradisului* (1940), which brings together essays published in *Gândirea* and courses held at the Faculty of Theology in Bucureşti from January 16th to May 20th, 1936[5]. Although many years before the appearance of this volume, Crainic's contribution was felt in the sphere of thinking, as Al. Dima said, "Mr. N. Crainic's contribution has been recognized long time ago and our intellectuals owe him, I would say, even the initiation in a field that the superior school almost completely ignored at the beginning of their appearance. [...] The discussion of issues of culture from the Christian Orthodox point of view, this is the general perspective of Mr. N. Crainic which stands for the aesthetic horizon[6]".

Interwar Romanian aesthetic theories are based, most of them, on rationalist thinking. A strong response was given at that time by Nichifor Crainic to these perspectives of approach, through – "defining beauty in theological and irrationalist limits. [...] In this respect, the concept of *Sofianic beauty* is symptomatically launched in 1932 by Nichifor Crainic, a concept developed then in *Nostalgia paradisului* (1940). According to its idea, «the perfect and absolute beauty» the prototype of beauty of nature and art identifies itself with the divinity[7]".

Seen from this century, Crainic's attempt appears as "a reforming update of aesthetics in the spirit of the Orthodox theology, a rethinking of the idea of beauty and the concept of beauty that leads to a new perspective on the function and purpose of art[8]".

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[5] Petru Ursache, "Postfaţă sau *teandria*", in *Nostalgia paradisului*, Nichifor Crainic, Editura Moldova, Iaşi, 1994, pp. 292-293.

[6] Al. Dima, "Gândirea", p. 65.

[7] Grigore Smeu and Vasile Morar, "Contribuţii româneşti la dezvoltarea esteticii". See subchapter "Emanciparea esteticii sistematice în deceniile doi-patru ale secolului XX", in *Estetica*, Marcel Breazu et al. Editura Academiei Republicii Socialiste România, Bucureşti, 1983, pp. 72-80.

[8] Constantin Stoenescu, „Modul teandric şi relaţia dintre religie şi cultură la Nichifor Crainic", manuscript from author, p. 6. Study published in the volume *Dialogul dintre teologie şi filosofie* 2, Editura Basilica a Patriarhiei Române, Bucureşti, 2009, pp. 68-185.

In Crainic's view, the Beautiful or "beauty is not an idea but the very existence of God revealed", and this is uncreated, so there is no attribute of divinity: "This beauty is God himself. God is perfect or absolute beauty[9]".

Upon this philosophical theme bent, in this era, also Lucian Blaga[10], about whom Crainic stated that "he opened up through it a perspective of systematic understanding of the Orthodox culture[11]".

Differences between the two approaches on *Sofianic beauty* are given by the fact that: While the Sofianicic is for the author of *Nostalgia paradisului*, a purely dogmatic element, which can not be separated only arbitrarily of the church dogma, for Lucian Blaga, who operates a clear dissociation between a «philosophy of style» and «foundations of the Orthodox Christian metaphysics» Sofianic is «the transcendent going down»[12]. Thus, the difference between the two meanings is required by the fact that Lucian Blaga puts the discussion in the horizon of the «stylistic» description of the phenomenon. However, the own description of a philosophy of style does not become in the extension of the first intention of any morphology of culture (which, to Blaga, is not associated in principle with judgments of hierarchy amongst historical cultures), a privilege of a mystical Orthodox significance, as to Crainic. Thus, Lucian Blaga, as observed in this case of the analysis of the Sofianic perspective as belonging to orthodoxy, overlaps deliberately confusing two different processes: that of the institutional sacred Byzantine style and that of creating the folk culture of the Orthodox people» (D. Micu, *Gîndirea şi gîndirismul*)[13]".

For a better understanding of this vision of art I will present below theoretical issues concerning the Christian worldview, on which Crainic bases his aesthetic reflections.

2. Theological aesthetics versus autonomous aesthetics. Nichifor Crainic, as observed by George Călinescu, Tudor Vianu, Dumitru Stăniloae

[9] Nichifor Crainic, „Sensul teologic al frumosului", in *Nostalgia paradisului*, Magda Ursache şi Petru Ursache (ed.), Editura Moldova, Iaşi, 1994, p. 103.

[10] See Lucian Blaga, „Perspectiva sofianică", in *Trilogia culturii*, Dorli Blaga (ed.), introductory study by Al. Tănase, Editura Minerva, Bucureşti, 1985, pp. 233-260.

[11] Nichifor Crainic, *op. cit.*, p. 108.

[12] Grigore Smeu and Vasile Morar, *op. cit.*, p. 78.

[13] Grigore Smeu and Vasile Morar, *op. cit.*, p. 78.

and Al. Dima, in the interwar period, Grigore Smeu and Vasile Morar, during the communist regime, Mihail Diaconescu and Petru Ursache in the last decade, pointed out a idea of art based on theological principles, entirely new, which is in opposition, but not totally with autonomous aesthetics. After G. Calinescu, "Nichifor Crainic builds an Orthodoxist aesthetics, of a metaphysical method of course[14]". However, as Ioan Lazăr observes, "George Calinescu misses the theandric essence of the aesthetic concept of the mentor of «Gândirea»[15]".

The quintessence of the aesthetic thinking of Nichifor Crainic is in the second part of the work *Nostalgia paradisului* and is entitled "Teologie şi estetică". This section looks at theorizing, from a theological perspective, of course, on the relationship between theology and aesthetics, the beauty of nature, art and the artist but focuses also on the issues raised by "inspiration", sublime and style and also including the report genius-holiness. Crainic's purpose was to "consider only those principles which, mainly partly than entirely, are the fundamental concerns of the current aesthetic discipline and reaching to the relationship between religion and art[16]".

In "Teologie şi estetică", Crainic demonstrates, against the modern negativism of the autonomous aesthetics, that "affiliation of art from religion is obvious[17]". A proof of this kind is given by the fact that "experimentally, the essence of art was not found yet[18]". For the moment, Crainic said that "the expression «science of aesthetics» does not correspond to reality, to a hope of becoming[19]".The considerations on the aesthetic are, as in any philosophical field approached by Crainic, against rationalist philosophical directions. Theoretical diversity should be reduced to a unity of thinking, and this can be given only by theology. There thus a "reduction of arts to theology" (Bonaventure). But Crainic, even if he does so, explains it very well. There are a number of reasons which can not leave theology "remain indifferent, raised by the autonomous aesthetics at the expense of art[20]. 1). “First, religion isn’t a mere department of human life together with science and aesthetics. [...] Nothing of what is spirit and its activities can not remain indifferent. [...] In this totalitarian embracing, having nothing dictatorial or suffocating in it since it involves constantly the free adhesion of human, comes naturally the question of art, which is one of the most specific human products[21]”. 2.) “Second, art, considered in its historical appearance, is the great daughter of religion and in its most glorious function is the mediator of the divine cult[22]”. 3.) “Third, the autonomy of art is not something absolute and not something that is radically opposed to Christian spirit. [...] Autonomy, that is freedom of expression of art, has always existed in the Church[23]”. 4) “Fourth, modern negativism was not satisfied with the mere statement of autonomy of aesthetics, as is clear to understand it, but falsifying the function of art, sought to make it a usurper of religion, a religion of pure aestheticism. Faced with such grotesque simulacra, theology can not wait too long to restore the truth[24]”. 5) “Fifth, the asserted inability of aesthetics to define beauty and essence of art through experiments makes more necessary[25]”, and 6) “In addition to the reasons mentioned, there is still one that makes us determined and encourages us to deal with such difficult problems, namely: just unaccustomedness and their absence from the concerns of our current theological studies[26]”.

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[14] George Călinescu, *Istoria literaturii române de la origini până în prezent,* Fundaţia Regală pentru Literatură şi Artă, Bucureşti, 1941, p. 790.

[15] Ioan Lazăr, *Nichifor Crainic: Între capcanele infernului şi nostalgia paradisului,* Editura Plumb, Bacău, 2000, pp. 70-71.

[16] Nichifor Crainic, *op. cit.*, p. 91.

[17] *Idem.*, p. 95.

[18] *Ibidem.*

[19] *Ibidem.*

Modern aesthetics, considered Crainic, rejecting traditional aesthetics, shows that it “manifests a strange aversion to philosophy of the beautiful[27]” and that to this aversion add, by default, that towards the “aesthetic mysticism”, which, as Crainic said, “Refers mainly to the beautiful and inspiring chapter of traditional aesthetics, which struggled to explain in philosophically what is beautiful in itself and which considered artistic inspiration as a spiritual phenomenon having sacred origins[28]". Modern Aesthetics, by this attitude, "describe a line descending from metaphysics to physics, imposed by the experimental method which speaks strongly for a physics of art[29]". The conclusion is that the "autonomous aesthetic self is, obviously, a deep descent of the prestige of the idea of beauty[30]".

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[20] *Ibidem.*
[21] *Idem.*, p. 92.
[22] *Ibidem.*
[23] *Ibidem.*
[24] *Idem.*, p. 93.
[25] *Ibidem.*
[26] *Ibidem.*
[27] *Idem.*, p. 96.

The idea of beautiful is found, in Crainic's opinion, in three forms: "beautiful in itself, or *transcendent* beauty, natural beauty and artistic beauty[31]". In relation to these types of beauty, theological thinking has "something to say": "If the old aesthetics was stating beauty metaphysically, beauty in itself in a way very related to theology, modern aesthetics, as I said, gave it up as a to concept empty of meaning that gives it no help at all. As for natural beauty and artistic beauty, philosophical aesthetics saw a link of unit between them, considering the beauty of nature as something prior that artistic beauty imitates or derives from[32]".

Regarding the beauty of nature, which, according to modern aesthetics, doesn't have an objective aesthetic quality, Crainic, bringing a Sofianic argument, believes that nature is beautiful "in a real and objective way", for it is God's creation: "It is the mirror that reflects the Creator's radiance from beyond. As such, its idea is closely linked to the idea of beauty in itself or beauty. In other words, what eliminates comfortably modern aesthetics is an integral part of Christian dogma"[33].

If beauty is in Crainic, in three appearances, beauty is presented, after the model of Plato's worlds, in a sensitive and intelligible or transcendent form. Man can accede to sensitive beauty, through inner and outer senses. Those from the last category' approaches aesthetic to mystical theology, because they man the possibility to communicate with "the unseen light of divinity". Relating to each other, "They («the inner senses») correspond to the physical senses through which we connect to the outer world. But while these spread it out in feelings, the inner senses work the other way round, concentrating towards the essential and eternal deepness of the world, to the unseen light of divinity[34]”. Beethoven, Homer and Milton are the most conclusive examples, which gives Crainic regarding the Creator even lacking one of these senses, even the most “important” for creation, manages to produce works of high artistic value, of divine inspiration: “Like Beethoven’s hearing, or Milton’s seeing, physical senses should die for the world, for only in this way spiritual senses can strain in the contemplation of supernatural beauty[35]”.

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[28] Nichifor Crainic, *op. cit.*, p. 95.
[29] Nichifor Crainic, *op. cit.*, p. 96.
[30] *Ibidem*.
[31] *Idem.*, p. 97.
[32] *Idem.*, pp. 97-98.
[33] *Idem.*, p. 98.

One can observe, according to this way of interpretation, as to the sensitive beauty, the creator par excellence, by loosing some physical capacity. They are able to continue to create through “spiritual senses”, for “Art is the artist” and the artist has access to ideas through divine revelation.

What does Crainic understand by the intelligible beauty or, as he says, transcendent? “This beauty, Crainic says, is God himself. God is perfect or absolute beauty. “Crainic makes a deliberate distinction between metaphysical beauty and theological beauty: “In metaphysics, beauty in itself is a dialectic conclusion of the operation of simplification and absolutesation of relative beauty; that is the idea of all ideas of beauty. In theology, beauty is not an idea, but the revealed existence of God[36]”. As for the ideas of beauty revealed by Schopenhauer, Crainic notes that “beauty is an eternal idea, but impersonal” because “it excludes the attribute of a living personality or the eternal idea[37]” and thus “is not equipped with the initiative to communicate its own beauty[38]”. Even in the case of Platonic theory it happens the same: “Souls are provided with the memory of previous existence, and embodied in man, when they see here a beautiful thing, they remember the beauty once seen in the eternal, superior order. In other words, it’s not the eternal idea that is communicated to the soul from its own initiative, but the soul relates to it by the power of memory which caused the sensation of sensitive beauty[39]”. It is here we see an exquisite differentiation. If we had to call L. Blaga too, we can say that in Plato’s theory that beauty is going down, not the transcendent. Opposite to philosophy, “In theology, on the contrary, communicability of absolute beauty is founded in divine personality. God is revealed to the world on His own initiative. Beauty is an attribute of His being. It is prior to the beauties of the world and is communicated or revealed in the same way to the other divine qualities. For theological thinking, this statement is a dogmatic truth[40]".

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[34] *Idem.*, p. 102.
[35] *Ibidem.*
[36] *Idem.*, p. 103.
[37] *Ibidem.*
[38] *Ibidem.*
[39] *Ibidem.*

3. Beautiful and beauty. The essay entitled "Sensul teologic al frumosului" (1932) reflects, from the Christian perspective, Nichifor Crainic's idea of art. To understand the theological meaning of beauty, Crainc differentiates between types of knowledge that is in a rational form (characterristic to modernity)[41] and revealed form that, in the Middle Ages, gave a unit of spiritual nature[42]. Crainic sees in the crisis of philosophy, in fact, the failure of reason, which does not subordinate to revelation. Thus, the disorder of philosophy is reflected in its branches: "Aesthetics at its turn shows us so many varieties of systems whose study disorients you as you deepen in it. Development of an autonomous thinking, and it is fatal to wear the same seal relative thinking personality[43]".

The multitude of ideas of beauty are for Crainic as many opportunities of disorientation. His question is, "Can a unique sense of beauty be found? The autonomous aesthetics, in his way of interpretation, does not offer such a solution. Aesthetic's autonomous mode of interpretation, does not offer such a solution. Theological thinking solves this problem through the *meaning* that it gives to beauty: "Our question should be moved to the reason guided by revelation"[44] because Christianism beauty is part of the body of doctrine as art[45].

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[40] *Idem.*, p. 104.

[41] "The spirit of modern «WHAT?» opposing the reason of revelation, refuses the discipline of the religious authority under which was developed in a unitary and unique system the medieval culture, and with boundless confidence in human powers, finds its own paths leading to the truth. Authority of revelation, as guiding force of all activities, is now replaced with what is called scientific method". (Nichifor Crainic, „Sensul teologic al frumosului", in *Gândirea*, Anul XII, no. 7-9, 1932, p. 311).

[42] Nichifor Crainic, *op. cit.*, p. 311.

[43] *Idem.*, p. 313.

[44] *Ibidem.*

[45] *Ibidem.*

Crainic mentions in "Sensul teologic al frumosului" the fact that the Holy Fathers haven't written special books about the artistic beauty, except *De musica* of St. Augustine, but as we know, in their writings references about beautiful and beauty, which required at that time a systematization. Jacques Maritain, Pavel Florensky, Serghei Bulgacov, Edouard Krakowski, Henri Bremond and Charles du Bos frequently appear and were already doing that in Europe. In addition, such research in the field of "aesthetic theology" from Romania, where Crainic has the merit of being a precursor, even the creator of the term *aesthetic theology* was more required "The expression theological aesthetics may seem strange and meaningless by its novelty. No, I have not encountered in theological treaties or treaties of aesthetic[46]". What is the purpose of this new discipline? We get the answer right from Crainic: "It may still be acceptable and it can give the name to a whole discipline where the aesthetic researches meet convergent to the confusion with the theological thinking[47]".

The fundamental model of aesthetic thinking of Christian origins is found by Crainic in the philosophy of Dyonisie Areopagitul, where although there can also be seen influences from Plato and Plotinus – this only if he was a successor or contemporary, not a proof of *heresy*. Comparing Plotinus with Dyonisie Areopagitul, Crainic emphasizes the differences, almost imperceptible between the two: "After Plotinus, the beautiful has its foundation and source in divinity and, therefore, art's aim is the return towards divinity, art is the preamble of religious ecstasy. After Dionysius, the beautiful is one of God's names and therefore the whole luster of forms in the world is but a reflection of the beauty of world from God[48]". On these interpretations, Crainic also highlights the concept of St. Augustine who argued that it's "artists who create the beautiful work by analogy with elements of God's creation and under His inspiration[49]".

However, the idea of beautiful, as a *divine name*, of Dyonisie Areopagitul, outweighs in the aesthetic reflection of Crainic. Out of his ideas Crainic points out the paragraph, probably in his own translation, in which the *beautiful* is of divine essence: «But still Dionisie goes further in a passage became famous for the aestheticians (IV, 7). Our holy theologians glorify the infinitely good; they also say that He is beautiful and beauty itself, that He is the boundless love. He is the beloved, and they give Him all the other names that belong to the charming beauty and mother of graceful things»[50]".

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[46] Nichifor Crainic, „O carte de teologie estetică", in *Gândirea*, Anul X, August-Septembrie 1930, p. 300.

[47] Nichifor Crainic, *op. cit.*, p. 300.

[48] Nichifor Crainic, *op. cit.*, p. 300.

[49] Nichifor Crainic, *op. cit.*, p. 300.

Being of divine essence, beauty is uncreated and is reflected in the cosmic world: "The order of the world is a reflection of the uncreated Beauty which became sensitive to created beauty[51]". Crainic doesn't take out the statement that between the Christian doctrine and Platonic ideology there is a correspondence: "In Platonic ideology very alike to the Orthodox thinking, the Good and the Beautiful are aspects of the same otherworldly idea. And beauty is seen as the last step which, after Plato, is reached by erotic excitement, that which is through love[52]".

Beauty of all that exists derives from the divine *Sofia*[53]. Dyonisie Areopagitul, under the form of the Neoplatonic discourse, describes *Sofia* using the qualities that the philosophical principle has. We quote the version proposed by Crainic: "«Of the right word – writes Dionysius – it is said that the divine wisdom is the principle, the producing cause, development, conservation and the term of any general and particular wisdom and of any intelligence, reason and feeling» (N.D.VII,2)[54]". In addition, Dyonisie Areopagitul presents the manifestation of *Sofia* as "the divine intelligence which penetrates all things through a transcendent sight, out of the universal cause it takes the science of beings still not existing. She knew the angels before producing them and then she created them, and all things materialized in and of eternity, if one may say so, before they received their existence. It's undoubtedly what Scripture wanted to teach us, saying that God knows the realities before their materialization[55]".

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[50] Nichifor Crainic, *op. cit.*, p. 300.

[51] Dyonisie Areopagitul *apud* Crainic, *op. cit.*, p. 314.

[52] Dyonisie Areopagitul *apud* Crainic, *op. cit.*, p. 315.

[53] Învăţătura despre *Sofia* sau *înţelepciunea divină* prezentă în „Pildele lui Solomon" a fost adâncită de Sfinţii Părinţi, iar în sec. XX a fost reactualizată, la început, de gânditorii ruşi V. Soloviev, P. Florenski şi S. Bulgakov. (Crainic, *op. cit.*, p. 316).

[54] Nichifor Crainic, *op. cit.*, p. 316.

[55] Dyonisie Areopagitul *apud* Crainic, *op. cit.*, p. 318.

4. About the beauty of nature and art. Due to the fact that "The world is God's mighty masterpiece and the unitary harmony where its parts order itself express in finite forms the infinite wisdom full of the creator's love[56]", derives, as Crainic says, "the aesthetic Sofianism of *nature*[57]" or of the *creature* that has "an objective and attractive character, meaning that it exists besides us and is endowed with the ability to communicate or move our soul[58]".

Autonomous aesthetics' object is only art, so it is "the science of *artistic beautiful*[59]", but for Crainic this approach is unilaterally if we consider that traditional aesthetics sees in nature and in art potential sources of beauty: "For philosophy, the things of nature and the creations art are part of the «sphere of beautiful objects»[60]". Neither Tudor Vianu disputes this, but however shows that there are at least three differences between *natural beautiful* and *artistic beautiful*: 1.) "First, natural beautiful seems to be a given element, while the artistic beautiful is a product, a work[61]". 2.)" The difference between natural and artistic beautiful is equally clear when we consider how different are they evaluated[62]", and 3.) "Finally, natural beautiful is infinite, while the artistic beautiful is limited[63]". The delimitation has a higher degree of utility also for our study because T. Vianu gives an example referring to Crainic's patterns of aesthetic thinking: "The beauty of nature as a whole was for the mystic of Plotinus and St. Agustin the proof of how the divine spirit grasps it. Not similarly, it goes with art. A work of art is a moment of beauty in an ugly or indifferent world[64]".

5. "Holly Sophia" in the XX th century. In the early twentieth century, the concept of *Sophia or Saint Sophia* and the expression *Sofianic*

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[56] Nichifor Crainic, *op. cit.*, p. 113.

[57] *Ibidem.*

[58] *Ibidem.*

[59] Tudor Vianu, *Estetica*, Ion Ianoşi (ed.), Editura pentru Literatură, Bucureşti, 1962, p. 9.

[60] Nichifor Crainic, "Nostalgia", p. 113.

[61] Tudor Vianu, *op. cit.*, p. 9.

[62] *Idem.*, 10.

[63] *Ibidem.*

[64] Tudor Vianu, *op. cit.*, p. 11.

beautiful returned to the attention of Christian thinkers, but also of philosophers of culture like Lucian Blaga, author of an essay entitled "*Perspectiva sofianică*".

In European thinking Florenski, S. Bulgakov and Soloviev are among the first who update the concept of *Sofia*, in the sense of divine wisdom, which is referred to in the *Proverbs (sayings) of Solomon*. The first two philosophers, among those listed, "identify *Sophia* with the great beauty that shines in the world"[65]. To illustrate the above statement, Crainic gives, from Florenski, the following quote: in terms of the Father hypostasis – says Florenski – Sofia is an ideal substance, a foundation of creature, a power or force of his being. In terms of hypostasis of the Logos, Sofia is the reasoning of creature, its meaning and truth. Finally, in terms hypostasis of the Spirit we mean by Sofia the spirituality of creature, her holiness, purity and chastity, that is her beauty» and further back, summarizes: «Sophia is beauty»[66]".

Of S. Bulgakov, Crainic gives a consistent quote, from which we retain only this section: «Sophia is revealed to the world as beauty which is the Sofianic sensitive nature of the world. Therefore art knows Sophia more directly than philosophy. If religion is a direct witness of God's self, art or in general beauty is itself a testimony to Sophia. [...] For any true art that brings beauty to light, has in it something visionary, discovering a higher reality»[67].

From the above we get the idea that in any creator of art manifests Sophia, giving vision, which confirms through certain *signs* the existence "of eternal life for which the present life is only the preparation and figure" (Berdyaev) or which awakens in the human being a *nostalgia* raising artistic creation, which by its beauty provides the surrogate of a heavenly homeland to the immortal spirit (Crainic).

6. "Sofianic perspective". We cannot omit the interesting contribution of L. Blaga in the philosophy of culture with reference to the issues raised by the term " Sofianic beautiful". Although its starting point is the theme put which was brought into the picture by Nichifor Crainic in "Sensul teologic al frumosului". His "perspective" is of great use to our study, because it brings an increase of understanding to Crainic's ideas from *Nostalgia paradisului*, and confirms the «Sofianic» "orientation of Orthodoxy", from a systematic angle, as Crainic would say.

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[65] *Idem.*, p. 11.

[66] Cf. lui Crainic, *op. cit.*, pp. 316-317.

[67] S. Bulgakov *apud* Crainic, *op. cit.*, p. 317.

In "Sensul teologic al frumosului", Crainic makes only a statement of ideas about *Sophia*, on which he builds, in fact, his own aesthetic reflections and does not want, for lack of space, to make objections. Blaga's "Perspectiva", however, refers also to the leakage or inconsistencies of Russian philosophers and to express satisfaction that, finally, "we are given this opportunity to outline such a philosophy of Orthodox culture[68]".

About the speculations of the Russian philosophers, Florenski and Bulgakov, in particular, Blaga, who said that "they don't excel in precision. The statements are turbulent but shapeless[69]". His conclusion is that "Russian Thinkers drawing attention on Sophia as the intermediate region, as we called it, between divinity and the world, adapts to the Christian law certain Gnostic and Neoplatonic concerns[70]". However, something positive happens, meaning that "By this adjustment, involving some power of initiative, Russian Orthodox thinking guides not only to Christian theology but also the Orthodox philosophy to a clearing of new possibilities[71]". "Sofianic Speculations, continues Blaga, offers, to both Orthodox theology and philosophy as well as laic philosophy, a meeting ground, a neutral place where a lot of topics and issues can be dealt with, on purely philosophical criteria, apart from any rigid dogmatism[72]".

L. Blaga believes that "sofianic" is the most important determinant style of the deep layer of Orthodoxy[73]. Sofia and *sofianic* are defined by Lucian Blaga as follows: "Sophia is the divine order and wisdom, which descends into transience, making visible imprints to the material. Sofianic is a certain feeling of man in relation to transcendence, the very specific feeling thanks to which man feels a receptacle of falling transcendence[74]".

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[68] Lucian Blaga, „Perspectiva sofianică", in *Trilogia culturii, II. Spațiul mioritic*, Editura Humanitas, București, 1994, p. 77.

[69] *Idem.*, p. 78.

[70] *Idem.*, p. 79.

[71] *Idem.*, p. 79.

[72] *Ibidem.*

[73] *Idem.*, p. 83.

[74] *Idem.*, p. 84.

According to L. Blaga, the *sofianic* is a *stylistic determinant* in matrix of orthodoxy, which emphasizes the feeling that "transcendence", "goes down in the receptacle of the world[75]". So the Orthodox spirituality can not be imagined otherwise[76].

The *sofianic*, besides the undeniable importance in the Orthodox Christian spirituality can be, "beyond the dogma", a "hypostatic determinant, still creative of big possibilities, of popular spirituality in eastern and southeastern Europe[77]".

As far as analysis of the *sofianic*, L. Blaga believes that the Orthodox spirituality is "bipolar[78]", which is somehow expected by Crainic, but to another level, when he observed the presence of two types of Christianity in the popular belief: the "cosmic" (M. Eliade) and the evangelic we talked about it elsewhere.

How is this "bipolarity", in Lucian Blaga's view? "It is focused on two extreme points: towards «transience» and towards «transitoriness»[79]".

These guidelines, established by the "bipolarity", manifest differently according to Blaga, inside Orthodoxy, compared to other Christian spiritualities: "First: in the «transtoriness» the Orthodox spirit turns his preferences towards the categories and the organic group. And the second the «transcendent» is represented in Orthodoxy as a descendant, and the world as a «receiver»[80]".

Crainic himself, as a philosopher of culture, saw this "bipolarity" presented throughout the whole of Romanian culture and, through his essays, most clearly is reflected in "*Spiritualitate*", aims to reconcile these two dimensions, often on bad terms, of the Romanian culture: "Our traditionalism wants a full subordination of the spirit, after the principle of the *Gospel*: he who humbles[81] himself will be exalted. He wants the alliance of our transitoriness with the eternity[82]".

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[75] *Ibidem*.

[76] *Idem.*, p. 93.

[77] *Idem.*, p. 97.

[78] *Idem.*, p. 103.

[79] *Idem.*, p. 103.

[80] *Ibidem*.

[81] "Umilința creștină e o înjosire în fața lui Dumnezeu pentru a face posibilă înălțarea la noblețea spirituală. Umilința creștină e lepădarea de tine însuți pentru a te

7. Nostalgia paradisului. "Christianity is the second creation of the world, that it is to be restores in grace through the sacrifice of Christ on the cross. What is the world itself? Where does it come from, and where does it go? We will never know unless we receive the discovery given by Jesus Christ[83]". "In the first paragraph of the paper *Nostalgia paradisului*, "written under the sign of the «teandric manner»[84]", rests the whole philosophical edifice of N. Crainic.

The aesthetic approach, from the *theandric* and *Sofianic* perspective, of Nichifor Crainic, shows the attitude that man must have in relation to divinity. Human existence is perfected through the deification of man, for man is made after the (*possible*) *image and resemblance* of God. Therefore, the human being must act in terms of His acts as a collaborator of Divinity, working to redeem the world: "To think the world as God thinks it, to love it as He loves it and to work in it and He does, here is the meaning of the teandric way of Christian faith and wisdom[85]".

All human creation is born out of *nostalgia paradisului*[86], Crainic says. This is the thesis, springing from a deep thought which represents the starting point of all artistic creation and moral life. This tragic feeling is permanent and specifically human: "Nostalgia of the paradise is the feeling that we get from this world and yet not belong to it" and "longing for the

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reintegra în ordinea supranaturală a harului dumezeiesc. Ea e condiția ridicării din mizeria terestră", Crainic, "Nostalgia", p. 99. "Humility is a Christian humiliation before God to enable ascent to spiritual greatness. Christian humility is denial yourself in order to get re dumezeiesc supernatural grace. It is the condition removal of dirt land".

[82] Nichifor Crainic, "Spiritualitate", *Gândirea*, nr. 8-9, august-septembrie 1928, p. 310.

[83] Nichifor Crainic, *op. cit.*, p. 319.

[84] Arhid. Ioan I. Ică jr. „Nichifor Crainic", *Revista Teologica*, no. 1/2010, p. 14.

[85] Nichifor Crainic, *op. cit.*, p. 8.

[86] "But Paradise is twofold: the earthly and the heavenly, as double is his nostalgia. Nostalgia or memory of the earthly paradise is the engine of material civilization which remains currently under the existence submissive to death, and nostalgia or longing for the heavenly paradise is the ultimate motive of spiritual culture facing the problem of death and the general meaning of existence". Ică jr. "Nichifor", pp. 14-15.

heavenly home of the immortal spirit[87]". "The initially lost community, says ahid. Ioan I. Ică jr., is updated in a real way through faith by the saints in the Church, and symbolically by culture and human creation, especially by the artistic one. Without being a religion, art can prepare souls for religion through the creations of artistic genius (like Dante, Milton, Eminescu, Dostoevsky), whose works get prophetic status[88]". According to such a view, art appears to be a divine revelation, a way of divine knowledge which flows in man and it deifies it: "Aware of the masterpieces they create, geniuses are unwittingly collaborators of God in this world through these sublime images of fictitious value suggests the higher reality of the spiritual world"[89].

8. Conclusions. In addition to the above reflections on art, Crainic's studies also concern issues regarding the origin of artistic inspiration, being a follower of the theory that inspiration does not act within its object, but "goes down", in transcendent, in it: "The same thing happens with the artistic inspiration and mystical and religious phenomena"[90]. To these is added the issue of the condition of the genius. Genius is reported to holy as, otherwise, does Berdyaev in *Sensul creației*. But the Russian thinker comes to equate these two maximum sizes of spirituality, which is unaccepted by Crainic, as I pointed out elsewhere: "Remaining deeply human in their nature, genius is the maximum size of natural life, the saint is the maximum size of spiritual life. History of the world gets a sense, not so much by the anonymous and inarticulate anxieties of the masses from the deep but by the crystallization from the heights of the personalities, embodied in geniuses and saints. [...] The supreme meanings of this world are the genius and sanctity[91]". Moreover, the Romanian author emphasizes, following Berdiaev, that the purpose of art is "to suggest that we are immortal. [...] It is the sensitive image of the opportunities beyond the world[92]". Reported to religious faith that gives man

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[87] Nichifor Crainic, *op. cit.*, p. 244.

[88] Ică jr., *op. cit.*, 15.

[89] Nichifor Crainic, *op. cit.*, p. 225.

[90] *Idem.*, 162.

[91] *Idem.*, p. 199.

[92] *Idem.*, p. 134.

"certainty of eternal order and personal immortality[93]", "Art is the only suggestion of possibilities[94]".

The author of *Nostalgia Paradisului* reflected the importance of style in artistic creation. Thus Crainic says about the style that is closely related to the idea that "religion influences culture. And so culture influences religion[95]". Differences in styles are the result of dogmatic differences, without losing sight of "other elements of ethnic and historical ambience, competing to create styles[96]". If dogma creates style, at the level of culture, style makes the difference. According to Jakob Burckhardt, Crainic evindenciates that without Church's dogma no culture can reach the unit of style "Style in the historical development of a culture is the creation of the Church[97]".

Crainic's reflections on art, works of art and culture had great importance and also had a great impact in the interwar Romanian cultural area, and maybe it would have gone beyond the borders, but the circumstances were unfavorable for the thinker and his work: first of all the First World War and after that the establishment of communism. Nichifor Crainic was imprisoned for 15 years (1947-1962) for his political ideas and was an author censured over four decades (1947-1990). However, to a careful review today of Crainic's work, especially the deeply philosophical one, still tells us something it does not keep away from that it exegetes.

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[93] *Ibidem.*

[94] *Ibidem.*

[95] *Idem.*, p. 53.

[96] *Idem.*, p. 54.

[97] *Ibidem.*

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Philosophy of Science and Epistemology in the Scientific Writings of Late Antiquity*

Adrian MURARU

ABSTRACT: This text expounds on the situation of epistemology and philosophy of science throughout Late Antiquity, with a particularly keen focus on the scientific writings of the period. Since exploiting these texts for the profit of philosophy of science is marginal, a special effort was made for the mapping of space. The main notes of the period, obvious in scientific writings, are relevant as well.

KEYWORDS: *Philosophy of science, epistemology, Late Antiquity, scientific writings*

My text is part of some research developed under the aegis of the postdoctoral program hosted by the Iasi branch of the Romanian Academy. In order to facilitate the understanding of what follows, several terms from the presentation's title shall be clarified. Once one will have assumed their meaning, the text will come across as significantly easier to understand. These clarifications, needed at the beginning of each paper that approaches such an "exotic" subject in the area of Ancient Philosophy of Science / Epistemology, are also needed from the perspective.

The phrase "Late Antiquity" may appear confusing. One might raise questions regarding its recent deployment in specialized papers, as well as with respect to the period that it actually covers. In this paper, "Late Antiquity" refers to the 1st – 5th century AD. The reason why this period was thus specifically designated (it is neither "Antiquity", nor "The Middle Ages") comes from observing several essential facts which, as they accrued, outlined the period's particular profile. The appearance of Christianity, the re-emergence of "Classical" Philosophic Schools, the existence of an unitary political space that included most of the geographic area adjacent to the Mediterranean Sea, the systematic development of sciences, the religious eclecticism and the imposition of a religion across the entire Empire. All these aspects mark the transition from "Classical" Antiquity, of diffused Hellenism, to the Early Middle Ages, where fragmentation (social, political, economic) offers a new profile.

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In order to clarify the title, and thus circumscribe the area of research, some observations must be made about the writings and authors of this period. We have also discussed about the general dating of the age in other articles on this topic. These "background" observations facilitate the understanding of the subject covered in this text; thus, it is difficult to understand the option for Late Antiquity. The circumscribed period is a special one. Late Antiquity is distinguished by quantity: the authors of the period write a lot. Their works are multiplied a lot (thanks to the "professsionalization" of this practice, but also to the exceptional economic situation, ever since the beginning of period), and these writings easily reach the entire Empire (the great urban centers communicate very easily). This impressive production of writings is favored by the appearance, in many cities, of public or private libraries, which constitute memorial centers of knowledge. It is enough to notice that the most prolific pre-modern Christian authors (Origin, for the Greek language, and Augustine, for the Latin language) live precisely in this period. They write a lot, and they write differently. The language of culture is Greek, and only the end of this period will bring Latin to the forefront in the area of scientific writings.

Taking into account how culturally fertile this period is, one may easily understand how wide its bibliographical gaps that the contemporary researcher confronts: the Middle Age period, which also brought a severe selection of works (only a few of the writings from Late Antiquity were transcribed and not merely for religious reasons: multiplication was achieved a lot harder, at least at the beginning of the Middle Ages; therefore, many Ancient writings became victims of the crisis of writing materials).

Naturally, the authors and works that were preserved are also the result of an "ideological" selection, and the Christian preeminence throughout the Middle Ages was decisive in this process: most of the writings from Late Antiquity have been lost. Statistically, most of those that survived are the religious ones, belonging to Christian theology: this constitutes a primary difficulty in recreating a comprehensive image of Late Ancient culture. Nevertheless, other writings also survived, such as those of practical utility (for instance, medical treatises, while the "demanding" ones, dealing with architecture, disappeared), or the "popular" ones (handbooks of astrology, popular novels). Philosophical writings survived, as well: Sextus Empiricus, Diogenes Laertios, Plotinus are important names for the history of philosophy, and (many of) their works are still accessible today.

Again (maybe paradoxically for us), and modernity is, in part, responsible for the situation of primary bibliography from Late Antiquity: the focus on dominant themes (a phenomenon present in the Middle Ages, as a matter of fact) is obvious. We are more interested in Plotinus rather than in Middle-Platonism (as a matter of fact, this name was only recently invented, when researchers considered that the period is too important to be overlooked), the "Classical" schools, rather than the trends generated by the period's obvious eclecticism. Thus, the interest in publishing some *princeps* editions from Late Ancient authors is minimal (all that we can recover from many of their works is only derived from the fragments that survived in the writings of other authors). Another disadvantage arises from the extraneous specialization that modernity imposed: the eclectic works of Late Antiquity, which addressed an audience capable of passing from a philosophical argument to a religious opinion, supported by natural observation, are difficult to follow by moderns, used to reading "specialized works", and to designate, according to exclusively scientific criteria. Therefore, many Ancient writings with speculative epistemological potential are neglected: the scientists interested in the History of Medicine will neglect the epistemological considerations of Galenus, just as the specialists in the History of Religions will overlook the epistemological considerations of Origen, while their attention is only guided by the respective specialties that they serve.

Consequently, one must, then, say that the interesting age has an obvious metaphysical preeminence, in a context that we define today as "eclectic:" the Philosophy of Science is only marginally treated (not even philosophical treatises are devoted to it; it seems that no writing has an "epistemological" title), and epistemological issues are often mentioned only second to ontological, cosmological, or anthropological subjects. This state characterizes specialized Philosophy works. Of course, it is even more difficult to find discussions on the Philosophy of Science or Epistemology in scientific works. And yet, it is not impossible.

Salvation comes precisely from the often condemned "eclecticism" of the period. Objectively, it is also possible because of the ancient configuration of sciences: with an often impressive theoretical background, specific science fields communicated much better than today. Strict specialization was often surpassed, in many cases: the volume of knowledge was considerably smaller than the one available to modern Science, and therefore it was possible to pursue a particular science (or even several at once), and yet still ponder on its (or their) premises, on the types of scientific validation, etc. This enterprise was encouraged, in any case, by a cultural period that would bring together sciences, philosophy and theology in a unified "whole" with totalistic claims. Thus, one may often notice a sort of "epistemological optimism" in the writings of the period.

Going beyond the multiple conceptual differences that the research of Late Antiquity assumes (the generally cultural ones are important, but the linguistic ones also matter), its scientific framework must first be mapped from the perspective of the Philosophy of Science / epistemological interest. The lost works are mute: the only possibility is to research what is accessible for us today.

By looking at the written testimonies of this period, we could say that scientific disciplines are unequally developed. Nevertheless, one should be taken into account that the selection and transmission of Late Antiquity's writings has relied on the perspective and interests of the following ages. By far, a "practical" science, medicine, dominates the primary bibliography, almost exclusively through the works of only one author, Galen. According to some calculations, Galen's preserved writings represent about one eighth of the entire Greek literature written until the second century AD. The author is a highly interesting one, reflecting exciting intellectual options: for him, "the best doctor is also a philosopher", and the neglect of demonstration (mathematics is a paradigmatic science here, for the Ancient thinker) can lead to major errors in medicine. Therefore, by means of the options he assumed, but also through the amplitude of his work (it should be underlined that most of it had already disappeared since the author's lifetime, in a fire that destroyed a sizable part of central Rome), this encyclopedic author was one of the most important sources who passed on the epistemological and Philosophy of Science' doctrines of Late Antiquity. On the other hand, a writing of encyclopedic scope has survived from Latin literature, as well, one that tries to cover all the areas of knowledge, as they occurred in the first century AD. Pliny the Elder's work, *Naturalis historia*[1], as its name also indicates, is a "research" on "the natural things", which implies a delimittation of the main areas of knowledge.

Moreover, other "specialized" scientific writings have survived, in different areas. For instance, in this period of Antiquity, the only architecture handbook that has survived until our times was written: as its author, Uitruuius, confesses, the work *De architectura*[2], which includes 10 books, attempts to compile a comprehensive summary of the discipline, extensively using the Greek bibliography (today lost) of the field.

Several works on "Astrology" from this age have reached us: Claudius Ptolemy is the most important name. His *Tetrabyblos*[3] (also known under the title *Apotelesmatica*) was known and appreciated in the following centuries: among many other subjects, it discusses, for instance, the conjectural nature of astrological knowledge. His opinions on the theme can also be found in an "astronomic" work, the only Ancient treatise dedicated to this scientific area that survived down to our time: *Mathematike suntaxis*[4] (preserved under the title *Almagesta*, with brilliant intellectual reception in the Arab and Latin Medieval worlds).

Galen's works enjoyed a significantly better fate, as they have been preserved in impressive proportions until today: their medical themes proved decisive in their preservation and transmission (the philosophical writings of Galen, probably considered of lesser practical utility, have been mostly lost). Thus, one may remark the sequences with obvious epistemological valences, even if the writings mainly approach medical subjects. Thus, discussions on the criteria of knowledge (a classic theme in the philosophy of Late Antiquity: remember the polemics that they caused, and which Sextus Empiricus, himself a doctor, reflected upon in his work). In *De optima doctrina*[5] (1-2), for instance, Galen rejects the skepticism practiced by Fauorinus: without assuming criteria of knowledge, *kriteria*, it is impossible to state that judgment, *krisis*, is possible. The idea of "mental evidence", important as well, is connected to trust, as a conceptual instrument that assumes "mental evidence" (here, Galen also mentions the treatise *De demonstratione*[6], which has unfortunately been lost, and which treated the issue *in extenso*). Another passage with epistemological potential can be spotted in *De symptomatum causis*[7]: it comprises a discussion about the "physiology" of senses in an integrationist reading that seeks to reconcile Hippocrates and Plato. He gives special attention to the "analytical method", which he identifies in Plato's writings, and which becomes essential in drawing accurate definitions. Galen notes upon two Platonic dialogues, namely *The Sophist* and *The political man*: they both practice the art of division, which must be applied in all sciences, including medicine.

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[1] See Pliny the Elder, "Naturalis historia", K. Rackham (ed.), *Loeb Classical Library*, Harvard University Press, Cambridge MA, 1938-1962.

[2] See Vitruv, *Zehn Bücher über Aechitektur*, C. Fensterbusch, Darmstadt (ed.), 1964-1976.

[3] See Ptolemy, Tetrabiblos (ed.) Frank E. Robbins, *Loeb Classical Library*, Harvard University Press, Cambridge MA, 1940.

[4] See *Claudii Ptolemaei opera quae extant*, *I-Syntaxis mathematike*, J.L. Heiberg (ed.), Teubner, Leipzig, 1898.

The same Galen carefully distinguishes between arguments specific to science, demonstrative ones and ones obvious in other areas of knowledge: he, then, applies this logical reading to Plato's *Alcibiades* dialog, in which he highlights the use of what he calls "syllogism", for the construction of the reasoning specific to science. Galen argues that the second type of hypothetical reasoning is to be found in Platonic dialogue: if Alcibiades knows what is just, he either learned it from someone, or he discovered it by himself. But Alcibiades neither learned what is just from someone, nor did he discover it by himself. Consequently, it follows that Alcibiades does not know what is just. The discussion takes place in *Institutio logica*, a writing that intends to classify the main types of reasoning, in relation to the desired type of knowledge. In fact, Galen tries to offer a "method" for medical science, based on demonstrative reasoning. One should note that the thinker believes philosophical reasoning is not as rigorous as scientific reasoning, because many philosophical doctrines cannot be supported through demonstration. From this point flows the firmness of Galen's belief that all arts have a similar structure, which they draw from a (correct) method of research, which in turn, implies the correct application of division. In *Adversum Lycum*[8] (3), the insistence on the universality of method is obvious: without it, no one can know anything at all scientifically. In fact, the four types of arguments admitted by Galen (demonstrative, dialectic, rhetorical and sophistic) carefully distinguish science from the imperfect ways of knowledge (i.e. non-demonstrative).

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[5] See Galen, "De optima doctrina", in *Galeni opera omnia*, vol. I, Kühn (ed.), Car. Cnoblochii, Leipzig, 1821-1833, pp. 40-45.

[6] The last trace of a mansucript of De demonstratione was in Wallachia (today Romania). See *Viaggi di Pietro della Valle I, Lettera XIII*, (G. Gancia, Brighton, 1843, p. 332.

[7] See Galen, "De symptomatum causis I", in *Galeni opera omnia*, vol. VII, Kühn (ed.), Car. Cnoblochii, Leipzig, 1821-1833, pp. 115-120.

As one may notice, Galen' theoretical option is better structured. His insistence in supporting his "method" can be opposed to the "non-methodic" attitude of Diophantus, the famous mathematician of Late Antiquity. Despite the innovations that the latter brought in the area of algebraic notation (which will, in turn, grant the autonomy of Algebra, as an independent mathematical discipline), the collection of problems *Arithmetica*[9] (partially accessible today) enumerates particular solutions exactly where the enunciation of a method of common solution was possible. Therefore, the author's "methodological" appetite comes across as minimal.

What I have presented so far outlines a general image of epistemological concerns in the scientific works of Late Antiquity. Unfortunately, in many cases, the authors of the period seem to manifest an epistemological or 'philosophy of science' interest only as a reflex or as an afterthought: implicitly, a "philosophy of science" is always present, more or less explicitly articulated. Few authors, however, and then usually among the encyclopedic ones, leave us with epistemological doctrines. This occurs even as the polemics indicated in Galen's fragments present us with an intellectual world that is very much alive, with many epistemological options. Unfortunately, this world is almost unapproachable due to the bibliographical losses: today regard Late Antiquity through the narrow slit of modernity.

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[8] See Galen, "Adversus Lycum", in *Galeni opera omnia*, vol. XVIII-a, Kühn (ed.), Car. Cnoblochii: Leipzig, 1821-1833, pp. 209-214.

[9] See I P. Tannery (ed.), *Diophanti Alexandrini opera omnia*, Teubner, Leipzig, 1893, pp. 1-449.

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Deduction Without Necessity

Ionel NARITA

ABSTRACT: In classical Propositional Logic, the deduction relationship is symbolized through material implication. Some valid formulas containing material implication, called *paradoxes of material implication*, have as interpretations, in the natural language, invalid inferences. In order to avoid material implication paradoxes, the American logician C. I. Lewis introduced a new symbol for deduction, namely, *strict implication*. In classical Logic, strict implication is undetermined. Lewis showed that strict implication can be determined if it is analyzed in a modal fashion and instead of classical Logic, a many-valued Logic is used. Although the paradoxes of material implication are eliminated, other paradoxes affect the strict implication symbol. All paradoxes concerning the deduction in Propositional Logic are solved if we renounce to the modal analysis of deduction (or strict implication) and it is formalized using the quantification of propositional variables, without any modal compound. In this way, an efficient decision method upon deduction can be developed.

KEYWORDS: *deduction, necessity, material implication, strict implication, quantification of propositional variables*

In this study, it is proved that the paradoxes generated by the modal analysis of deduction relationship can be avoided using the quantification of propositional variables. In this way, we needn't replace the classical frame of Logic with so-called non-classical Logics.

Inferences[1] are elements of the Cartesian product $\mathbf{P}(S)\times S$, (S = the set of propositions; $\mathbf{P}(S)$ = the set of all parts of S), namely, inferences are systems with the structure: R = <{P_1, …, P_n}, Q>, where the propositions P_i are the *premises*, and *Q* is the *conclusion* of the inference *R*. An inference is *valid* if and only if, in any context where the premises are true, the conclusion is also true. The class of valid inferences is a *part* of a Cartesian product, so, it is a relation between the set of the premises and the conclusion of a valid inference. We'll call this relation, *deduction* and we'll note it with the symbol "|-".[2] It follows that, if *R* = <{P_i}, Q> is an inference, then:

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[1] Ionel Narita, "The Paradoxes of Strict Implication", *Logos Architekton*, 1&2, 2010, p. 61.

{P_i}|-Q ≡ "*R* is valid". (1)

One of the Logic's main goals is to establish if a given inference is valid, respectively, if there is a deduction relationship between the set of the premises and the conclusion of that inference. In order to achieve this purpose, the deduction has to be *symbolized* with the means of the symbolic language. The Propositional Logic, (PL), symbolizes deduction through the constant of *material implication*, □, which is a truth function defined by the following matrix:

Table (1)

p	q	p□q
1	1	1
1	0	0
0	1	1
0	0	1

Deduction is symbolized through material implication keeping into account that the inferences can be expressed using *conditional propositions*, with the syntax "If *P* then *Q*", as it follows:

1. <{P_i}, Q> □ "If $\&_i P_i$ then Q" (2)

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[2] Notations and symbols used in this study are P, Q : propositions; R : inferences; A, B, F : formulas; p, q : propositional variables; & : conjunction; □ : equivalence; = : equality; ⊃ : material implication; → : strict implication; N : operator of necessity; M : operator of possibility; ~ : operator of negation; |- : deduction.

2. $\langle\{P_i\}, Q\rangle$ is valid □ “If $\&_i P_i$ then Q” is a tautology.
3. $\langle\{P_i\}, Q\rangle$ is valid □ $\{P_i\}|\text{-}Q$
4. $\{P_i\}|\text{-}Q$ □ “If $\&_i P_i$ then Q” is a tautology.

The conditional propositions, at their turn, are formalized in PL using the material implication symbol:

1. “If $\&_i P_i$ then Q” □ $\&_i p_i$□q (3)
2. “If $\&_i P_i$ then Q” is a tautology □ “$\&_i p_i$□q” is a valid formula in PL.

From (2.4) and (3.2) we’ll obtain:

$\{P_i\}|\text{-}Q$ □ “$\&_i p_i$□q” is a valid formula in PL. (4)

Consequently, an inference is valid if and only if the formula obtained by the symbolization of deduction using material implication is logically valid or, in other words, if that formula is a *logical law*. But, there are valid formulas of Propositional Logic containing material implication, called *paradoxes of material implication*, which correspond, through interpretation, to non-valid inferences.[3] For instance, it is easy to verify that the formula:

p□(q□p) (5)

is a logical law. Despite this, if the material implication is interpreted through deduction, a false statement is obtained that:

{P}|-({Q}|-P), namely, “Any inference with a true conclusion is valid”. (6)

For example, the deduction:

{Vinegar is sour}|-({Some people have a beard}|-Vinegar is sour) (7) is not placed because the validity of the inference <{Some people have a beard}, Vinegar is sour> doesn't follow from the fact that vinegar is sour (*truth*)[4].

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[3] Clarence Irving Lewis and C.H. Langford, *Symbolic Logic*, Dover Publ., New York, 1959, pp. 86, 142.

The paradoxes of material implication raise doubts on the capacity of logic to recognize the valid inferences. Even if a formula, *F*, is proved as valid with the means of Propositional Logic, we cannot draw the conclusion that the inferences obtained through interpretation from *F* are, at their turn, valid.

In order to avoid the material implication paradoxes, the American logician, C.I. Lewis, introduced a new symbol in the vocabulary of Propositional Logic, named *strict implication*, "→", with the role to symbolize the deduction[5]. In his system, the deduction is no longer represented by material implication but only by strict implication, and reciprocally, only strict implication can be interpreted by deduction:

$$\{P_i\}|\text{-}Q \ \square\ \&_i p_i \rightarrow q \tag{8}$$

Strict implication cannot be reduced to a combination of constants belonging to Propositional Logic, so that, there is no truth function corresponding to it. Consequently, in the two-valued logic, the strict implication remains *undetermined*[6]:

Table (2)

p	q	$p \rightarrow q$
1	1	undetermined
1	0	0
0	1	undetermined
0	0	undetermined

We can notice that the strict implication has a determined value, *false*, only when the antecedent is true and the consequent is false; for any other situation, the strict implication has no determined value.

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[4] Lewis and Langford, *Symb. Logic*, p. 242.
[5] Lewis and Langford, *Symb. Logic*, p. 247.
[6] Lewis and Langford, *Symb. Logic*, p. 199.

Lewis shows that strict implication can be determinate if we get out from the frame of classical, two-valued logic and accept a many-valued logic sending, for this purpose, to an Aristotle's suggestion that, in a valid inference (syllogism), the conclusion *necessarily* follows from the premises[7]:

1. {P}|-Q □ "If P then Q" is necessarily true. (9)
2. {P}|-Q □ N(p□q)
3. p→q □ N(p□q)

In this way, the strict implication is analyzed using material implication and the operator of necessity:

strict implication (or deduction) = material implication + necessity (10)

Although there is no truth function corresponding to the operator of necessity in the two-valued logic, we can find such a function in a many-valued logic. For example, in a three-valued logic[8], L3, with the values *certainly true*, (1*), *certainly false*, (0*), and *doubtful*, (?)[9], the following function corresponds to the operator of necessity:

Table (3)

p	Np
1*	1*
?	0*
0*	0*

At its turn, the material implication can be defined as a function in L3 by the next table[10]:

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[7] "A syllogism is an argument in which, certain things being posited (the premises), something other than the premises *necessarily* results from their being true". Aristotle, *Prior Analytics*, Oxford University Press, Oxford, 2009, pp. 24b 18-20.

[8] Lewis and Langford, *Symb. Logic*, p. 213.

[9] Lewis and Langford, *Symb. Logic*, p. 214.

[10] Lewis and Langford, *Symb. Logic*, p. 214.

Table (4)

Cpq[11]	1*	?	0*
1*	1*	?	0*
?	1*	1*	?
0*	1*	1*	1*

It follows that, admitting the modal analysis, there is a function corresponding to the strict implication in L3. Strict implication is decomposed into necessity and material implication, p→q □ NCpq:

Table (5)

p	q	Cpq	NCpq
1*	1*	1*	1*
1*	?	?	0*
1*	0*	0*	0*
?	1*	1*	1*
?	?	1*	1*
?	0*	?	0*
0*	1*	1*	1*
0*	?	1*	1*
0*	0*	1*	1*

We see that, by modal analysis, the indetermination of strict implication is eliminated and the constant of strict implication can be defined as a function only replacing the two-valued logic with a many-valued logic, as L3[12]. The values of L3 aren't truth values, but *epistemic values*. They are not propositions' values; they represent justified epistemic *attitudes* about propositions. For instance, a proposition is "certainly true" if there is no doubt about its truth. A proposition is "doubtful" if we are not sure if it is true or not. For that reason, a logic, such as L3 must be considered rather an *epistemic logic*; it shows us the justifying conditions to admit a proposition true by certitude. The function associated to strict implication, following modal analysis, is not a truth function but a function defined on the class of epistemic values. In the same time, it results from the fact that the necessity is equivalent with certainty:

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[11] Lewis and Langford, *Symb. Logic*, p. 214.

[12] Lewis and Langford, *Symb. Logic*, p. 235.

necessarily true proposition = certainly true proposition (11)

If a proposition is necessarily true then it is certainly true, and reciprocally the justified certainly true propositions are also necessarily true.

The introduction of strict implication as a mean to symbolize the deduction relation and the modal analysis of strict implication avoid the material implication paradoxes. As we can see in the following decision table, the formula $p\rightarrow(q\rightarrow p)$ isn't a logical law, so it isn't paradoxical although there are invalid inferences of its form.

$p\rightarrow(q\rightarrow p)$ □ NCpNCqp, by modal analysis. (12)

Table (6)

p	q	Cqp	NCqp	CpNCqp	NCpNCqp
1*	1*	1*	1*	1*	1*
1*	?	1*	1*	1*	1*
1*	0*	1*	1*	1*	1*
?	1*	?	0*	?	0*
?	?	1*	1*	1*	1*
?	0*	1*	1*	1*	1*
0*	1*	0*	0*	1*	1*
0*	?	?	0*	1*	1*
0*	0*	1*	1*	1*	1*

If *p* is doubtful and *q* is certainly true, then the given formula is false, namely, it isn't valid, having the consequence that some interpretations of it must be invalid inferences, avoiding a paradox.

Although, using modal analysis of strict implication the paradoxes of material implication are eliminated, other paradoxes appear, like *the paradoxes of strict implication*[13]:

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[13] Lewis and Langford, *Symb. Logic*, p. 248.

1. $Np \to (q \to p)$, (every inference with a necessary conclusion is valid); (13)
2. $N{\sim}p \to (p \to q)$, (every inference with impossible premises is valid)[14].

Let's show that the first formula is valid in Lewis' system:

$Np \to (q \to p) \;\square\; NCNpNCqp$, by modal analysis. (14)

Table (7)

p	q	Cqp	NCqp	Np	CNpNCqp	NCNpNCqp
1*	1*	1*	1*	1*	1*	1*
1*	?	1*	1*	1*	1*	1*
1*	0*	1*	1*	1*	1*	1*
?	1*	?	0*	0*	1*	1*
?	?	1*	1*	0*	1*	1*
?	0*	1*	1*	0*	1*	1*
0*	1*	0*	0*	0*	1*	1*
0*	?	?	0*	0*	1*	1*
0*	0*	1*	1*	0*	1*	1*

Admitting the modal analysis of strict implication developed by Lewis, we reach the paradoxical result that a necessary proposition derives from any premise.

On the other hand, modal analysis has as consequence the identification of necessity with tautology.[15] A proposition is necessarily true if and only if it is a tautology:

1. $\{P_i\}|\text{-}Q \;\square$ “If $\&_i P_i$ then Q” is a tautology. (15)
2. $\{P_i\}|\text{-}Q \;\square\; \&_i p_i \to q$
3. $\&_i p_i \to q \;\square\; N(\&_i p_i \square q)$, modal analysis of strict implication.
4. “If $\&_i P_i$ then Q” $\square\; \&_i p_i \square q$
5. “If $\&_i P_i$ then Q” is a tautology $\square$ “If $\&_i P_i$ then Q” is necessarily true.

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[14] Lewis and Langford, *Symb. Logic*, p. 58.
[15] Lewis and Langford, *Symb. Logic*, p. 251.

The same result is obtained using the Lewis' definition of necessity. For C.I. Lewis, a proposition is necessarily true if and only if it is the consequence of its negation:

$Np \square \sim p \to p$[16] (16)

The relation (16) takes place only if *p* is a tautology. Let's suppose that *p* may be false. In this case, for $p = 0$,

1. $Np = 1 \to 0$, therefore: (17)
2. $Np = 0$, namely, if *p* has the interpretation false then *p* isn't
necessary so, only the tautologies are necessarily true propositions
and reciprocally, in Lewis' system.

If we take into consideration the former results, it follows that, according to modal analysis of strict implication, the next relations take place[17]:

1. strict implication = material implication + necessity; (18)
2. strict implication = material implication + tautology;
3. necessary true = tautology;
4. necessary true = certain true (in a justified way).

Lewis uses just the equivalence between tautology and necessity in order to reject the strict implication paradoxes.[18] An inference with a tautology as conclusion is valid no matter which are its premises without paradox. In similar fashion, if the premises of an inference are contradictory, then any conclusion can be drawn. All inferences with a tautology as a conclusion and inferences with contradictions as premises are valid, even if they are *trivial*. For that reason, such inferences are not paradoxes. For instance, the valid formula “(p&~p)□q” isn’t a material implication paradox because the inferences with the structure <{P, ~P}, Q> are valid (they are not in contradiction with the condition of an inferences’ validity). The paradoxes are present only when, from a valid formula, invalid inferences are obtained through interpretation. If the necessity is equivalent with tautology, the inferences with a necessarily true conclusion or impossible premises are valid and so, we aren’t in the presence of the paradoxical situations.

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[16] It is interesting that, while in a two-valued logic the formula "$\sim p \to p$" means "Np", (*p* is necessary), in the three-valued logic, L3, the correspondent formula, "NC~pp", has the interpretation "Mp", (*p* is possible).

[17] David H. Sanford, *If P, then Q: Conditionals and the Foundations of Reasoning*, Routledge, London, 2003, p. 69.

[18] "Hence, the two paradoxical theorems cited are no ground of objection to the supposition that strict implication, $p \to q$, coincides in its properties with the relation '*q* is deducible from *p*'.", Lewis and Langford, *Symb. Logic*, p. 251.

On the other hand, if we take into account the relations (18.3) and (18.4), the modal analysis of strict implication generates epistemic paradoxes. If only the certain propositions are necessarily true and if the tautology coincides with necessity, then only the tautologies are justified certainly true propositions. Logic is the set of tautologies so that, from the modal analysis of strict implication, it follows that only Logic is a justified science. We arrive, in this way, to the problem of I. Kant: how can we justify other disciplines different from Logic, like natural sciences? Kant exposes that problem in *Critique of Pure Reason*, asking the question: *how is pure natural science* (or *Physics*) *possible*?[19] We’ll call this paradox, according to which only Logic is possible, *Kant’s paradox*.

We saw that, both the paradox of strict implication and the Kant’s paradox are generated by equivalence between tautology and necessity; therefore, these paradoxes are also equivalent:

Kant’s paradox = strict implication paradox (19)

The solution of both paradoxes consists in admitting that some factual propositions (which are not tautologies) are necessarily true. The paradoxes appear when the necessary propositions are the same with the tautologies and the impossible propositions coincide with the contradictory propositions:

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[19] Immanuel Kant, *Critique of Pure Reason*, Cosimo, New York, 2009, p. 13.

Table (8)

<table>
<tr><td colspan="2">true propositions</td><td colspan="2">false propositions</td></tr>
<tr><td>tautologies</td><td colspan="2">factual propositions</td><td>Contradictions</td></tr>
<tr><td>necessary propositions</td><td colspan="3">contingent propositions</td></tr>
<tr><td colspan="3">possible propositions</td><td>impossible propositions</td></tr>
</table>

The Kant's paradox is avoided by recognizing the existence of some factual propositions which are necessarily true and of other which are impossible, according to the following table:

Table (9)

<table>
<tr><td colspan="3">true propositions</td><td colspan="3">false propositions</td></tr>
<tr><td>tautologies</td><td colspan="4">factual propositions</td><td>contradictions</td></tr>
<tr><td colspan="2">necessary propositions</td><td colspan="4">contingent propositions</td></tr>
<tr><td colspan="4">possible propositions</td><td colspan="2">impossible propositions</td></tr>
</table>

Kant himself solved the paradox through the hypothesis that there are true *synthetically a priori* propositions, namely, propositions which are not *analytical* (or they are factual) and necessary; in other words, Kant rejects the equivalence between *analytic* (tautology) and necessarily true propositions[20].

From the previous considerations, it follows that there must be necessary propositions which are also factual, namely, we have to deny the equality between the class of tautologies and the class of necessary propositions. As we saw until now, this equivalence is the consequence of the modal analysis of strict implication. It follows that the already mentioned paradoxes can be eliminated only if the modal analysis is abandoned.

In fact, the modal analysis of strict implication (and of deduction) started from a wrong understanding of the Aristotle's text. The philosopher born in Stagira claimed only that, in a valid inference, the conclusion follows with necessity from premises *but not vice-versa.* Aristotle's text allows only for the deduction:

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[20] Kripke S. uses the term "*a posteriori* necessary propositions", Saul Kripke, *Naming and Necessity*, D. Reidel Pub., Dordrecht, Boston, 1972, p. 140.

$$\{P_i\}|\text{-}Q \;|\text{-}\; N(\&_i p_i \square q) \tag{20}$$

and not the equivalence:

$$\{P_i\}|\text{-}Q \;\square\; N(\&_i p_i \square q) \tag{21}$$

as Lewis supposed.

If the modal analysis is rejected, then the strict implication remains undetermined, and the problem of decision upon the valid inferences has no solution. We'll show that modal analysis is not necessary, but it is possible to develop an analysis of strict implication (and also of deduction) without modalities, avoiding paradoxical situations. The constant of strict implication can be analyzed by material implication and *quantification of propositional variables*, replacing the indetermination of strict implication through a *conditional determination.* In this fashion, the goal of logical decision upon the inferences is to establish the *conditions* of inferences' validity because there is no *absolute* validity but only a *conditioned* one.

An inference is valid if and only if the corresponding conditional proposition is a tautology:

1. $\{P_i\}|\text{-}Q \;\square$ The proposition "If $\&_i P_i$ then Q" is a tautology. (22)
2. The proposition "If $\&_i P_i$ then Q" is a tautology $\square$ The formula "$\&_i p_i \square q$" is a law of the Propositional Logic.
3. The formula "$\&_i p_i \square q$" is a logical law $\square$ The formula "$\&_i p_i \square q$" has the interpretation *true* for *any interpretation of the propositional variables,* p_i *and* q.
4. The formula "$\&_i p_i \square q$" has the interpretation true for any interpretation of the propositional variables, p_i and q $\square$ $(p_i,q)(\&_i p_i \square q)$.
5. $\{P_i\}|\text{-}Q \;\square\; \&_i p_i \rightarrow q$
6. $\&_i p_i \rightarrow q \;\square\; (p_i,q)(\&_i p_i \square q)$
7. $\{P_i\}|\text{-}Q \;\square\; (p_i,q)(\&_i p_i \square q)$

We have analyzed the strict implication and, simultaneously, the deduction, by material implication and quantification of the propositional variables, without appealing to the modal operators[21]:

strict implication (deduction) = material implication + quantification (23)
of propositional variables[22].

We'll call this analysis *conditional* which reduces strict implication to material implication and propositional variables' quantification. Using *conditional analysis*, the strict implication is determinate, namely, we can associate it as a matrix so that, to the determined values of the arguments corresponds determined values of strict implication. For this purpose, let's consider first the general case of an expression with universally quantified variables, "$(p_i)A(p_i)$".

We can distribute the possible interpretations of the propositional variables, p_i, into two disjunctive and complementary classes: I_t containing the variables' interpretations for which the formula A receives the interpretation *true* and I_f having as elements the variables' interpretations for which A has the interpretation *false*. The universally quantified expression, "$(p_i)A(p_i)$", has the interpretation *true* only if A has the interpretation *true* for all its variables' interpretations, namely, only if there is no interpretation of p_i for which A has the interpretation *false*; with other words, the formula $(p_i)A(p_i)$ is *true* only and only if the class I_f is empty:

Table (10)

p_i	I_t	I_f	Conditions
$A(p_i)$	1	0	
$(p_i)A(p_i)$	1	-	$I_f=\varnothing$
	0	0	$I_f\neq\varnothing$

From the table (10), it results that a universally quantified expression, A, receives the interpretation *true* when the condition that I_f, be it an empty

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[21] Ionel Narita, "Parad. Of Strict Impl.", p. 67.

[22] Lewis also uses the quantification of the propositional variables, but with other purposes. Lewis and Langford, *Symb. Logic*, p. 179.

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$(p_i)A(p_i)$	1	-	$I_f=\varnothing$
	0	0	$I_f\neq\varnothing$

From the table (10), it results that a universally quantified expression, A, receives the interpretation *true* when the condition that I_f, be it an empty class, is fulfilled. If the class I_f is not empty, then the expression A has the interpretation *false*.

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[21] Ionel Narita, "Parad. Of Strict Impl.", p. 67.

[22] Lewis also uses the quantification of the propositional variables, but with other purposes. Lewis and Langford, *Symb. Logic*, p. 179.

In the case of strict implication, if we keep into account the former relation, “p→q □ (p,q)(p□q)”, the possible interpretations are given by the following table[23]:

Table (11)

Interpretations	I_3	I_2	I_1	I_0	Conditions
p	1	1	0	0	
q	1	0	1	0	
p□q	1	0	1	1	
(p,q)(p□q)	1	-	1	1	$I_2=\varnothing$
	0	0	0	0	$I_2\neq\varnothing$
p→q	1	-	1	1	$I_2=\varnothing$
	0	0	0	0	$I_2\neq\varnothing$

We have reached the result that strict implication is true only and only if the class I_2 of the variables’ interpretations is void, namely, when there are no interpretations p=1 and q=0. If the tables (2) and (11) are compared, anyone can notice that, by a conditional analysis of strict implication, the undetermined situations disappear, being replaced with *conditioned determination* (strict implication has determined interpretations only if some conditions are accomplished). For instance, strict implication is *true* when there is no such interpretation that the antecedent is true and the consequent is false. We could say the strict implication is a *conditioned truth function*.

In order to develop the conditional analysis of strict implication there, it wasn’t necessary to replace the two-valued logic by a non-classical logic. The traditional values, *true* and *false*, are sufficient to solve the problem of strict implication analysis. Moreover, we haven't needed to search other truth functions different from the known ones. The conditional analysis uses the means of classical logic, proving that the problem of deduction can be solved inside of it.

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[23] Goldblatt R. and Kane M., at their turn, used the quantification of propositional variables in order to analyze the strict implication, but they obtained other results, trying to save its modal interpretation. Furthermore, in the case of this interpretation, necessity defined as: Np □ p□(p□p), coincides with tautology like in Lewis’ analysis. Robert Goldblatt and M. Kane, “An Admissible Semantics for Propositionally Quantified Relevant Logics”, in *Journal of Philosophical Logic*, 39, 1 (2010), p. 74.

The conditional analysis avoids both the paradoxes of material implication and the paradoxes of strict implication. For instance, it can be proved that the formula corresponding to the deductions with the structure "{P}|-({Q}|-P)" is not a logical law. By formalization inside of the conditional analysis we obtain a quantified expression:

1. {P}|-({Q}|-P) (24)
2. {P}|-({Q}|-P) □ p→(q→p)
3. p→(q→p) □ (p)(p□(p,q)(q□p))
4. (p)(p□(p,q)(q□p))

The decision matrix upon the expression (24.4) is the following:

Table (12)

Interpretations	I_3	I_2	I_1	I_0	Conditions
p	1	1	0	0	
q	1	0	1	0	
q□p	1	1	0	1	
(p,q)(q□p)	1	1	-	1	$I_1=\varnothing$
	0	0	0	0	$I_1\neq\varnothing$
p□(p,q)(q□p)	1	1	-	1	$I_1=\varnothing$
	0	0	1	1	$I_1\neq\varnothing$
(p)(p□(p,q)(q□p))	1	1	1	1	$I_1=\varnothing\vee(I_3=\varnothing\&I_2=\varnothing)$
	0	0	0	0	$I_1\neq\varnothing\&(I_3\neq\varnothing\vee I_2\neq\varnothing)$

The given expression is not valid because, if there are I_1 interpretations, (p=0, q=1), and I_3 or I_2 isn't empty, then it has the interpretation of being false, so that, in these conditions, the deductions with form (24.1) don't have a place. However, there are valid inferences of the form <{P}, {Q}|-P> if I_1 is void or I_3 and I_2 are empty classes, namely, if *P* is a consequence of *Q* or if *P* is contradictory. For instance, the following inference is valid:

<{Socrates is mortal}, <{Socrates is a man and all men are mortal}, Socrates is mortal> is a valid inference> (25)

We notice that there are both valid and non-valid inferences with the same form. The validity of inferences is not *absolute* but *conditioned.*

Let's show now that the deduction "{NP}|-({Q}|-P)", (the strict implication paradox), doesn't take place inside of conditional analysis of strict implication. First, the deduction is formalized in conformity with conditional analysis:

(26)

1. {NP}|-({Q}|-P)
2. {NP}|-({Q}|-P) □ Np→(q→p)
3. Np→(q→p) □ (p)(Np□(p,q)(q□p))
4. (p)(Np□(p,q)(q□p))

After a logical decision we reached the result that the formula (26.4) is not valid, so the strict implication paradox can't take place:

Table (13)

Interpretations	I_3	I_2	I_1	I_0	Conditions
p	1	1	0	0	
q	1	0	1	0	
q□p	1	1	0	1	
(p,q)(q□p)	1	1	-	1	$I_1=\emptyset$
	0	0	0	0	$I_1\neq\emptyset$
Np	1	1	1	1	$(I_1=\emptyset\&I_0=\emptyset)\vee(X\&(I_3\neq\emptyset\vee I_2\neq\emptyset))$
	0	0	0	0	$(I_1\neq\emptyset\vee I_0\neq\emptyset)\&(\sim X\vee(I_3=\emptyset\&I_2=\emptyset))$
Np□(p,q)(q□p)	1	1	1	1	$I_1=\emptyset\vee\sim X\vee(I_3=\emptyset\&I_2=\emptyset)$
	0	0	0	0	$I_1\neq\emptyset\&X\&(I_3\neq\emptyset\vee I_2\neq\emptyset))$
(p)(Np□(p,q)(q□p))	1	1	1	1	$I_1=\emptyset\vee\sim X\vee(I_3=\emptyset\&I_2=\emptyset)$
	0	0	0	0	$I_1\neq\emptyset\&X\&(I_3\neq\emptyset\vee I_2\neq\emptyset))$

Following Kant, we have noted by *X* the condition for a factual proposition to be necessary[24]. There are factual necessary propositions only if the modal values of propositions changes in time; for that reason, X is a temporal condition. A proposition is necessarily true if it is a tautology, or it is not a contradiction and it fulfills the X condition.

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[24] Immanuel Kant, *Critique of Pure Reason*, p. 9.

We got the result that there are invalid inferences with a necessary conclusion because the formula (26.4) has the interpretation *false* when p is necessary (the X condition is satisfied) and it isn't a consequence of the premise q. In other words, the strict implication paradox doesn't take place. However, if p is not a necessary factual proposition or if p is a consequence of the proposition q, then the inferences with the structure <{Np}, {q}|-p> are valid.

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Problems with Devitt’s Version of Ontological Scientific Realism

Gabriel TÂRZIU

ABSTRACT: What entities should we accept into our ontology? In the contemporary philosophical literature, this metaphysical question is exploited to exhaustion. In Quine’s opinion, we can give a single-word answer to this question: “”Everything” – and everyone will accept this answer as true[1]”. Of course, things are far from being that simple – the philosophical community is well known for its difficulty in reaching agreement even regarding the most simple of subjects. But this is far from being a simple subject. To see this, it is enough to look for a moment at the diversity of entities that can figure in the scope of “everything”: possible worlds, fictional and / or mythological beings, mathematical entities, unobservable scientific posits, etc. So, if what we understand by “everything” is all these entities taken together, I don’t think we would be able to find a single philosopher that accepts the above answer. My aim in this paper is not to argue for or against one of the multitude of answers to the above questions, but to determine if these problems can be settled before any epistemological or semantic issues, or if we need, before addressing any ontological problem, to tackle first some semantic and / or epistemological problem.

KEYWORDS: *Michael Devitt, the problem of realism, scientific realism, metaphysics, ontological scientific realism, entity realism, theory realism, theory anti-realism*

What is scientific realism?

In the philosophy of science, the spectrum of answers to the above questions stretches from the antirealists’ rejection of everything theoretical /

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[1] Willard W. O. Quine, „On what there is”, in *Contemporary readings in the foundations of metaphysics,* S. Laurence and C. Mcdonald (eds.), Blackwell, Oxford, 1998, p. 32.

unobservable to the contemporary mathematical realists' trust that science can take us beyond our physical world and reveal something about the Platonic Universe. Somewhere in the middle we find what can be dubbed as the standard scientific realist, who is content with an ontology comprising most unobservable scientific posits, such as electrons, pulsars, viruses, etc. The standard scientific realist is usually a theory realist who tries to obtain the entities with which to populate his ontology by squeezing them out from what he considers as mature and established theories. He takes the best strategy to argue for the reality of the unobservable entities of science as coached in terms of theories being right about the way the unobservable world is structured. So, the fore-front of his program is occupied by the argument for the truth or approximate truth of our best scientific theories. The argument for the existence of the unobservable entities these theories talk about comes second and is strongly dependent on the success of the first argument.

There is another way, though, to argue for a realist position in the philosophy of science without having to adopt theory realism. This path is taken by the entity realists. Usually, the entity realist is a theory anti-realist who finds epistemic security only in what is obtainable through some sort of experimental mediated connection to the world (to particular entities and processes); almost everything else you find in science is, in their view, epistemologically (and hence ontologically) worthless. The reality of the entities, supported by the existence of this kind of connection and some low-level generalizations about their behavior, is the most we can hope to obtain from science. Unlike the theory realist, who takes as good evidence for the reality of an entity the existence of a true or approximate true theory about that entity, the anti-theoretic scientific realist is reluctant to accept other sources of warrant for belief in the existence of an unobservable entity except the experimental contact with it. So, they accept the ontology of science but are not so pleased with the common trust in the (approximate) truth of the theoretical descriptions this ontology receives.

It is evident from this short discussion that characterizing scientific realism is not a task to be taken lightly. We can distinguish between several theses considered to be suited for such a purpose:

- *The ontological thesis:* most of the unobservable entities postulated in a (mature) scientific context populate the world as well as observable objects do.
- *The semantic thesis:* the theoretical claims about unobservables are, as well about observables, truth-conditioned descriptions of an independent reality.
- *The epistemological thesis:* scientific theories are our best source of knowledge about the whole world – observable and unobservable.
- *The axiological thesis:* science aims at true theories.

Most scientific realists prefer to present their position as a research program comprising several of these theses (usually the first three), but there are philosophers who choose only one of them as constitutive for the central aspects of their view and argue that, although it is important to support something at least resembling the other theses in order to defend or make a case for scientific realism, they should not be included in its characterization.

Devitt's characterization

Between those who think that scientific realism is best characterized from a purely ontological vantage point, a prominent place is occupied by Michael Devitt. He thinks that, when discussing the problem of realism, we have to keep in mind the following five maxims:

1. *When considering realism, distinguish the constitutive and evidential issues.*
2. *Distinguish the metaphysical (ontological) issue of realism from any semantic issue.*
3. *Settle the realism issue before any epistemic or semantic issue.*
   When considering the semantic issue, don't take truth for granted.
4. *Distinguish the issue of correspondence truth from any epistemic issue*[2].

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[2] Michael Devitt, *Realism and truth*, Blackwell, Oxford, 1991, pp. 3-4.

In Devitt's opinion, once these problems have been put in the right order, realism becomes a "boring doctrine". He formulates realism as that doctrine according to which tokens of most common sense physical types exist independently of the mental. The scientific version of this common sense realism amounts to nothing more than replacing, in the formulation above, "common sense physical types" with "unobservable entities of science". This doctrine has two dimensions: the existence and the independence dimension. According to the independence dimension, the world exists objectively and so it is not constituted by anything human (as our epistemic values or our capacity to refer to it). According to the existence dimension, a realism worth fighting for is one that holds that "we are *more or less right* in the physical entities we posit"[3]. The qualification "more or less" is introduced because science is full of problematic entities, undesired even in a hard-headed realist's ontology. No one wants to commit to the existence of ideal objects as perfect gases or ideal incompressible fluids, or to abandon entities, such as phlogiston or caloric. So, without qualifications, this formulation is far from presenting a defendable position.

Since Devitt's "argument for Scientific Realism is reminiscent of the earlier one for Common-Sense Realism[4]" we should take a glimpse first at his strategy in defending the second type of realism. He gives an indirect argument for common sense realism. After formulating the Cartesian skepticism, Devitt emphasizes that the skeptics' strategy is to insist that "the Realist is justified in his belief, only if he can give good reasons for eliminating alternative hypotheses to Realism. Yet, the skeptic argues, the Realist is unable to give such reasons…[5]".

Devitt distinguishes between four answers to skepticism:

(a) *the fundationalist answer:* the idea here is to find a secure area of knowledge and to place it at the basis of any other knowledge claims. Justifying realism from this perspective is, in Devitt's view, hopeless[6].

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[3] Michael Devitt, *op. cit.*, p. 18.

[4] Michael Devitt, *op. cit.*, p. 109.

[5] Michael Devitt, *op. cit.*, p. 62.

[6] Michael Devitt, *op. cit.*, pp. 69-71.

(b) *Kant's answer:* in Kant's view, the object of knowledge is partly constituted by our cognitive activities and so the idea of a gap between the object of knowledge and the knowing subject looses its grip. The problem with Kant's strategy is that it "uses the wrong method and proceeds in the wrong direction[7]".
(c) *adopting skepticism:* Devitt thinks that "The problem with this reaction is that it leaves us so little[8]".
(d) *the naturalist's response:* the naturalist starts from what science gives us and from realism and tries to find an epistemology from within science. From this perspective "skepticism is simply uninteresting: it throws the baby out with the bath water[9]". This is the answer Devitt adopts and uses for justifying his realism.

The problem with this last answer to skepticism is that it doesn't represent an answer at all, but a way to avoid or ignore skepticism by saying it is uninteresting. That is why some philosophers argued that naturalism not only expresses pessimism in epistemology regarding the possibility of offering an answer to skepticism, but, more than that, it makes it theoretically invulnerable[10]. Devitt actually admits right from his introduction to *Realism and Truth* that, from a naturalist perspective, skepticism is unanswerable[11]. But, someone can draw the attention here that, since what opened the way for the alternative hypotheses to realism was a kind of pessimism regarding the possibility of answering the skeptic, Devitt fails to offer "good reasons" for eliminating such alternatives to realism.

I am not interested here, though, to see if Devitt's argument for common sense realism is good or not. What I want is only to asses the implication of his Maxim 3 upon the problem of realism.

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[7] Michael Devitt, *op. cit.,* p. 73.

[8] Michael Devitt, *op. cit.,* p. 64.

[9] Michael Devitt, *op. cit.,* p. 75.

[10] See for example Sosa, „Beyond scepticism to the Best of our Knowledge", in *Mind,* vol. xcvii, Issue 386 (April 1988) and Williams, „Epistemological realism and the Basis of Scepticism", in *Mind,* vol xcvii, Issue 387 (July 1988)

[11] Michael Devitt, *op. cit.,* p. 5.

A preliminary question which needs answering is this: what is the problem of realism? If we look at the history of the dispute between realists and their opponents, what we notice is that the main problem for the realists was to offer a justification for the independence dimension of their position. Historically, the first anti-realist doctrines sprang due to problems with this dimension. The idealist, for example, had no problem with admitting that common sense objects exist; he was discontented with admitting their independence from our mind, from our disposition to believe and affirm things about them. The social constructivist doesn't deny the existence of facts; what he rejects is their independence from our social practices – scientific knowledge is, from their perspective, socially construed. Now, if we accept that the problem of realism is that of offering a justification for the independence dimension, then we have to reject Devitt's Maxim 3: we can not distinguish and settle the problem of realism from / before any epistemic or semantic issue because this problem is itself an epistemological and / or semantic problem. It is epistemological because, in order to offer a justifycation for the independence dimension, it is necessary to answer the skeptic. It is semantic because in order to explain how we can talk about this mind-independent world, we have to account for the link between our beliefs as well as the world, and for this we need a theory of reference.

We can find another reason for rejecting Maxim 3 from Michael Dummett. He considers that when we focus our attention upon metaphysical disputes we find it difficult to understand the content of the doctrines involved in these disputes. In each case we are presented with an alternative picture, but the non-pictorial content of these pictures is unclear. We find ourselves dealing with the following problems:

(i) we don't have a criterion to help us decide in favor of one or the other side of the debate;

(ii) we can not assess the metaphysical arguments, such an assessment presupposing the knowledge of the content of the opposing theses which would help us decide which of them is true. But, as we can not explain in non-pictorial terms what such an acceptance amounts to, we don't have such knowledge[12].

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[12] Michael Dummett, *The Logical Basis of Metaphysics*, Gerald Duckworth & Company Limited, 1991.

According to Dummett, a way of escaping this difficulty would be to adopt a different strategy in order to approach these disputes. He thinks that we should understand them as debates about a disputed class of statements. So, these debates between realists and their opponents ("anti-realists", as Dummett generically names them) are best characterized not as concerning the existence of some sort of problematic entities, but as being about a disputed body of statements and what makes a statement from this class true when it is true.

It is easy to see that it is not so simple to evaluate a certain metaphysical view if we take, for example, the case of common sense realism: what would count in this case as evidence in favor of this view? Clearly we can not resort to visual perceptions because there is no visual perception of physical objects that can convince us that they exist independent of our perception. Dummett thinks that since "no agreed method of settling these disputes was available, philosophers picked sides in them on the basis of predilection, not because they have discovered a means of resolving them[13]".

So, settling the realism issue first doesn't seem to work in the case of common sense realism. What about scientific realism? Does Devitt's Maxim 3 have a better chance here? Not really. Settling the realism issue first in this context doesn't get us very far. Actually, it doesn't even offer us the means to distinguish scientific realism from anti-realist doctrines. This is immediately apparent if we take into consideration anti-realist positions, such as instrumenttalism and constructive empiricism. The sustainer of either one of these views is prepared to concede the possibility of their being an unobservable already structured theory-independent part of the world. What he won't accept is, in the case of instrumentalism, that scientific theories are in any way something more than instruments for predicting and systematizing observable phenomena, or that science is in any way offering us knowledge of a level of reality more profound than the observational one, in the case of constructive empiricism. The first one of these doctrines takes the scientific claims about unobservables to lack any assertoric content, while the other one adopts a realist semantics but denies any epistemic access to the unobservable part of the world. So, besides taking a stand on the existence of scientific posits, the scientific realist sees himself in need to reinforce his position with two other theses: one epistemic and the other semantic.

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[13] Michael Dummett, *The Seas of Language*, Oxford, 2000, p. 463.

The semantic thesis takes theoretical claims about unobservables as being as well as those about observables truth-conditioned descriptions of an independent reality and is intended to block / prevent any attempt to interpret the theoretical discourse non-literally, distinguishing, thus, scientific realism from instrumentalism.

The epistemological thesis is making explicit the trust that scientific theories are our best source of knowledge about the whole world: observable as well as unobservable. This thesis is meant to block agnostic or skeptical versions of empiricism, distinguishing, thus, scientific realism from constructive empiricism.

Devitt's replay at this point can be that, by adding these two other theses to scientific realism we are conflating the constitutive and evidential issues of realism, and so, we are in direct violation of Maxim 1. A healthy realist attitude has as its core and starting point the ontological thesis; everything else should be taken only as add-ons, as arguments in support of this position. Conflating it with a semantic and epistemic thesis is both harmful and unnecessary. It is harmful because it leads to powerful complications and, what is more, because it has proven to be a good starting point for strong anti-realist arguments (as e.g. those given by Dummett). The problem is that supplementing the metaphysical thesis with other dimensions seems to be necessary: how else could the scientific realist dissociate his position from instrumentalism and agnostic or skeptical versions of empiricism?

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Philosophical Hermeneutics

Reading and Understanding of Oneself

Ştefan AFLOROAEI

ABSTRACT. We might be able to grasp more accurately the meaning of questions regarding reading – and, equally, interpretation – were we to view it in connection with the understanding of oneself. From this perspective, key differences exist between reading philosophy nowadays and the way in which certain stoics (such as Seneca), Plotinus or Christian scholars used to read philosophy. Most often, they engaged in reading for the purposes of meditation (*meditatio*) and an elevated way of life. As far as we are concerned, today, reading brings rather a form of loneliness and a desire for a constantly deferred dialogue (Paul Ricoeur). Yet it demands increasingly more freedom: it may be playful and disseminating (Jacques Derrida), inspired (Richard Rorty) or free from any canon (Jonathan Culler). This fact however exposes it to other forms of solitude. Eventually, it is worthwhile nurturing the possibility of alternative readings, correlated by virtue of their actual differences, in order to overcome any indifference in one's relation to a text.

KEYWORDS: *reading, meditation, understanding of oneself, deferred dialogue, interpretation, alternative readings*

Questions that still concern us

Almost every time when the issue of understanding a text arises, the discussion of what it means to interpret something is resumed. The same questions tend to recur naturally: What is the meaning of one's effort of understanding nowadays? How does reading and interpreting a page unfold? When exactly can one claim to understand what one is reading? Could it be that all this ultimately occurs as anyone sees fit?

Such questions re-emerge both when one expects to hear them and when one least expects it. Nietzsche was justified in arguing that the discussions driven by the ancient Greek sophists prompted the birth, in the European space, of "theoretical man". This marked the emergence of the kind of conscience that cannot, for instance, read anything without reflecting on the real meaning of reading, on the usefulness of the reading effort, on who and how reads, on the conditions for a proper reading, etc.

Yet the fact mentioned above does hold a certain value, one that I might call speculative at this time. It concerns the need to look at ourselves in the mirror, *ut in speculo*, as tough we were strangers to ourselves for an instant. Questions arise at once with this speculating – or speculative – self-splitting. And the question facing oneself becomes real, leading oneself into a dead end situation. Gadamer terms it "the problem of hermeneutics", as it concerns "the phenomenon of understanding and the correct interpretation of what has been understood"[1]. In fact, it emerges as a hermeneutic experience, one that is inevitable to philosophical thought. Ever since Nietzsche, this experience has been accompanied ostensibly by a new critical conscience, which brings to the fore "the habits of thought and language built up in the individual in his communication with his environment"[2]. In this manner, it brings into question both one's own mode of understanding and, more broadly, the mindset of an era, its extensive and durable reflexes.

How philosophy was read formerly

At this point I would like to connect the fact of understanding oneself to the fact of reading of some pages of philosophy. Yet before I proceed, I would like to briefly look at something that we discuss rather rarely, namely how we engage in reading of pages of philosophy.

We are fully aware that in this day and age reading does not unfold in keeping with the rituals of the past. For instance, reading is no longer done aloud or in the company of others, who might share one's way of life.

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[1] Hans-Georg Gadamer, *Hermeneutik I, Wahrheit und Methode. Grundzüge einer philosophischen Hermeneutik*, J. C. B. Mohr (Paul Siebeck), Tübingen, 1990, p. 1.

[2] *Idem.*, p. 5.

It does not take place in a space that was properly furnished in advance, at defined moments in the day or, especially, with a distinct purpose from ordinary ones. Michel Foucault rightly observes that the philosophers in late antiquity ask their disciples to read few authors, few works, and few excerpts thereof, and to dwell on a few passages deemed important for exercising their thought. Seneca, for example, refers to the burden of books (in *On Tranquillity of Mind*, IX, 4)[3]. Hence the widespread practice of abstracts, which caused certain authors, such as Epicurus, to come to be known only through some synopses, drawn up after their death by loyal disciples. Similarly, the use of compilations and anthologies, the extraction of significant quotations, as Seneca himself would do in his correspondence with Lucilius.

In Christian milieus, such as the one where Augustine lived, reading most often was performed in accordance with a genuine ritual . In those times, the rules of reading referred above all to the encounter with elevated writings. They were typical of life in a carefully ordered space, such as the monastic one, where opening the book had a symbolic and liturgical dimension. Consequently, certain stages or moments had to be strictly observed. "In a work aptly titled *Scala paradisi,* Giug de Chartres (who lived in the first half of the 12th century) presents the following sequence of moments: first, there is the reading (*lectio*) of the Holy Scripture; second, the meditation (*meditatio*) on what was read; third, the prayer (*oratio*), that is 'lifting one's mind to God'; finally, contemplation (*contemplatio*), which marks the 'elevation of the soul to God'"[4]. The first two moments, reading (*lectio*) and meditating (*meditatio*) on the texts read, can also be found outside the monastic space, such as in the private or in the school environment.

What was though the understanding of meditation in those times? In the stoic milieu, for example, it means above all an exercise, preparing oneself for something. It involves, in Foucault's terms, "[performing] an exercise of appropriation, the appropriation of a thought /.../ and being so profoundly convinced of it that we both believe it to be true and can also repeat it constantly and immediately whenever the need or opportunity to do so arises. /.../ Second, the *meditatio,* and this is another aspect, consists in making a sort of experiment, an experiment of identification /.../; not so much thinking about the thing itself as practicing the thing we are thinking about. Obviously, the most famous example is the mediation of death /.... Meditating on death is placing yourself, in thought, in the situation of someone who is in the process of dying, or who is about to die, or who is living his last days[5]". The last example is illuminating. Nevertheless, there were many situations of life that could be the subject of meditation as such.

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[3] "What is the use of having countless books and libraries, whose titles their owners can scarcely read through in a whole lifetime? The learner is, not instructed, but burdened by the mass of them, and it is much better to surrender yourself to a few authors than to wander through many". (Seneca, *On Tranquillity of Mind* 9.4 ff).

[4] Cf. Valeriu Gherghel, *Porunca lui raabi Akiba*, Polirom, Iaşi, 2005, p. 118.

The example of the stoics is not at all singular. Plotinus, in the 3rd century AD, used to read little and most often aloud. He would read unhurriedly, and most times in the presence of several disciples. One could assume that he would read in this manner even when he was by himself or when he happened to know certain passages by heart. He did not read no matter the time or place though. He would comment jointly with others the passages read with eyes and uttered aloud, usually excerpts from Plato's dialogues. They would then meditate on the issues raised for discussion in order to ascertain their relevance for their way of life. Meditation had to unfold according to the abilities of each participant, without any excesses[6].

What about other, later philosophers? Did they read in the same manner? Probably not, as certain differences are inevitable with the passing of time. Descartes, for example, instructs his readers on how to approach his philosophy writings. "I should also have added a word of advice regarding the manner of reading this work, which is, that I should wish the reader at first to go over the whole of it, as he would a romance, without greatly straining his attention or tarrying at the difficulties he may perhaps meet with in it, with the view simply of knowing in general the matters of which I treat; and that afterwards, if they seem to him to merit a more careful examination, and he feel a desire to know their causes, he may read it a second time, in order to observe the connection of my reasonings; but that he must not then give it up in despair, although he may not everywhere sufficiently discover the connection of the proof or understand all the reasonings, it being only necessary to mark with a pen the places where the difficulties occur and continue to read without interruption to the end; then, if he does not grudge to take up the book a third time, I am confident he will find in a fresh perusal the solution of most of the difficulties he will have marked before; and that, if any still remain, their solution will in the end be found in another reading[7]". As such, Descartes orients his reader's reading towards the matters of metaphysics. He lets him realise that the world of signs in a book resembles the world in which we ourselves live. It can be viewed as a narrative, so that the first reading that he recommends is linked with this idea that he had shared ever since his youth.

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[5] Michel Foucault, *Hermeneutica subiectului. Cursuri la Collège de France (1981-1982)*, Romanian translation by Bogdan Ghiu, Editura Polirom, Iaşi, 2004, pp. 340-341.

[6] Cf. Porphyirios, *Viaţa lui Plotin*, § 11, Romanian translation by Cristian Bădiliţă and Cristian Gaşpar, Editura Polirom, Iaşi, 1998.

Nietzsche is not at all oblivious to the way in which someone reads his writings. He would often urge his readers, as he did in *Ecce homo*, to read him unhurriedly, slowly and paying attention to the pace of that which is said. He even tells the readers to consider the disposition of their soul and their breathing, the tone of voice and the sound of certain words. Almost everything must occur such as when someone is about to decipher all alone a musical score in order to perform it on stage.

The reader of philosophy nowadays

Today though, how exactly does one engage in reading a page of philosophy? It is not easy to tell, especially as everyone thinks of oneself first and of one's own manner of reading something.

What we do know, nowadays, is that the reader usually observes other cultural reflexes. If it is a philosophy book, the reader may very well read it without getting personally involved at all. Usually, he does not read it out of a desire to change his own way of life. He does not generally have reason to seek a new call of destiny in the pages of a book. He reads for other reasons, most often because reading is required by someone or something, or he must look something up, write something, tell something to someone or objectively record something. He usually reads in a hurry and, probably, without experiencing any special state of mind. He tends to lack the time and reasons to revisit what he has read. Even when he reads diligently, attentively and carefully, he is fully aware that it is still only a book, one among the multitude available to be read.

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[7] René Descartes, *Scrisoarea a II-a (către cel care a tradus această carte, căreia îi poate folosi drept prefață)*, in *Principiile filosofiei*, Romanian translation by Ioan Deac, Editura IRI, București, 2000, p. 71.

The above notwithstanding, I would not completely exclude the fact of a special encounter, as when something changes one's way of looking at things. Or moreover the idea of a truly essential reading and – consequently – of an essential book. I would even accept the idea, cherished by Eliade, that reading becomes the occasion for genuine initiation. Modern man finds in reading – and in cultural experience – a form of initiation. Obviously, this is possible. However, a philosophy book nowadays inspires a different attitude from that inspired in Seneca's or Plotinus's disciples. One can stand alone in front of a book, without expecting it to change one's way of life. In the face of a book, one can experience different states, ranging from the curiosity of the neophyte, the methodical attention of the apprentice, the detachment or the irony of the one who has grasped its vanity, to the indifference and boredom of the one who is weary of the amount of things one is told. One rarely has the sense that by reading one is extricated from everyday time and from one's regular sequence of activities. To achieve this, more than the particular enjoyment of reading would be necessary.

Let us accept the idea that the person who reads a page of philosophy does not necessarily do so because he might be forced to. He does not do it, for instance, because he might need it for a seminar or a paper, or for delivering a lecture, introducing a book or preparing for a public debate. Likewise, he does not need to read it in order to discuss it with friends afterward or, while being alone, to gain a clearer understanding of a certain idea or concept. Naturally, anyone can use their reading for such purposes. Yet if only these were at stake, one could not call him a reader devoted to philosophy. For the latter reads even in the absence of such motivations. We might say that his motivations are more refined, more subtle, yet I believe he indulges in reading in the absence of any motive. He engages in reading as though it might express in the simplest fashion a vocation or, even more so, a calling. I do not know if such words are necessary, as their use may seem emphatic in context, yet I cannot find others more fitting for now.

Even when such a reader does not exist, we should still keep his image in our mind. For he would simply represent an ideal situation, a starting point for a more proper understanding of the concrete forms taken by philosophical reading. The latter may be distinguished precisely by their distance from a possible ideal, unconditioned reading. Some, for instance, appear as properly instrumentalised, similar to tools, or linked to the atemporal prestige of a text, whereas others involve something that is aesthetic, free or gratuitous.

Reading as a constantly deferred dialogue

We recognise that the reading of a text, when it truly matters to the person engaged in the act, prompts a special emotion in the reader. The latter feels that he is alone in front of the text, or that the text is alone in front of him, as in that moment two singularities would meet. This is linked to the fact that both the text and the reader, by virtue of the act of reading, are removed from their own ordinary time.

Paul Ricœur notes, at one point, something special in this regard. “Sometimes I like to say that to read a book is to consider its author as already dead and the book as posthumous. For it is when the author is dead that the relation to the book becomes complete and, as it were, intact. The author can no longer respond; it only remains to read his work[8]”. As the author is unable to respond, live dialogue becomes impossible. Reading is not dialogue in the proper sense of the term, although it aspires to it. Dialogue in the proper sense here means rather a constantly deferred desire of the one who reads, like an ever-receding shore. Therefore it should never become an obsession for the reader of today. Reading brings face to face two worlds, two ways of being in the world, although their live dialogue is constantly postponed.

Seeking to better illuminate his comments, Ricœur rejoins the meaning that Husserl approximates through *Lebenswelt*, world of life, and Heidegger through the phrase *In-der-Welt-sein*, being-in-the-world. Thus he argues that to interpret “is to explicate the sort of being-in-the-world unfolded in front of the text”[9]. He immediately returns to his statement to offer further clarification. “In effect, what is to be interpreted in a text is a proposed world, a world that I might inhabit and wherein I might project my ownmost possibilities". He calls it in simple terms "the world of the text, the world probably belonging to *this* unique text"[10]. Yet what exactly can happen in such a world? The author of the text himself ends up being instituted by the text as such ("he stands in the space of meaning traced and is inscribed by writing")[11]. Neither the reader is in a different situation: as an 'actualised utterance' he appears and retreats from the plot in keeping with the reading itself.

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[8] Paul Ricœur, *De la acțiune la text. Eseuri de hermeneutică II*, Romanian translation by Ion Pop, Editura Echinox, Cluj-Napoca, 1999, p. 129.

[9] *Idem.*, p. 107.

Playful, disseminating reading

Some of the questions evoked in the beginning have been explored in the sphere of radical hermeneutics that I would like to briefly review below.

Let us recall, first of all, what Derrida declares as he finds himself in the position of being himself the reader of some pages by Nietzsche. From the outset, he asserts that Nietzsche is the text and nothing but the text, i.e. he is not a particular author from a particular intellectual environment, who aimed to discuss a particular philosophical theme[12]. Any pre-textual, sub-textual and thematic interpretation (employed by Heidegger in interpreting excerpts from Nietzsche) are irrelevant in this case. They would all betray the text itself, reaching outside it and seeking something that the text itself does not possess. This would ignore the dynamics of the text itself: its contradictions and contrasts, its fragmented, discontinuous, decentred, indetermined, playful and perspectivist character. As for his own most mutually incompatible statements, Nietzsche "said that he said them", more precisely he "wrote that he said them". Ultimately, thought is meaningless outside of speech or writing.

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[10] *Idem.*, p. 108.

[11] *Idem.*, p. 132.

[12] Cf. Jacques Derrida, *Éperons. Les styles de Nietzsche*, Flammarion, Paris, 1978; idem, *L'Oreille de l'autre: otobiographies, transferts, traductions*, Textes et débats avec Jacques Derrida, sous la direction de Claude Lévesque et Christie V. McDonald, Montréal, VLB éditeur, 1982.

The reader can now pay attention to the possible structures of difference (not of being) and to the play of the multiple (and less to certain formal oppositions: surface and depth, form and content, spontaneous and reflected, play and seriousness, leisure and work). He will notice numerous shifts of meaning, ruptures and diastases in the text as well as the ellipses and ripples it creates.

The reading itself, performed by such a reader, would be largely modified as a result. Compared to "ordinary" reading, it becomes non-linear (sinuous), non-univocal (repetitive through difference), non-thematic (purely textual). The reader is to perceive the freedom of language (beyond any compact character, closed, linear, equal to itself). He will sense the shifts in meaning in the immanence of the text and the sliding discursive planes. Not a given meaning, but, with the emergence of unexpected intervals, the actual dissemination of the text. This kind of reading can open up one's vision to other fields, such as the fields of sensitivity and of the body, of the dream and the unconscious, of the eros and of phantasms.

Inspired reading

Yet what is one to do when faced with writings that project a tremendous desire for a system, as in the case of Hegel or Schelling? Richard Rorty suggests one solution for this, namely reading *The Phenomenology of the Spirit* as a literary work, as a narrative[13], in which one would encounter characters (such as self-consciousness, being and time, absolute spirit), in addition to plots, unexpected reversals, imagery, moving metaphors, etc.

In this particular case, reading denotes a means of using the text, a manner of doing something with it. Reading enables "a process of putting it to work"[14]. One cannot refer to a text *as such* in the absence of reading, in the absence of it being put to work. Texts do not relate to something exterior, called reality. Furthermore, the reader does not relate to a text as though it might possess something in itself. "Reading is a matter of reading them in the light of other texts, people, obsessions, bits of information, or what have you, and then seeing what happens". Each new reading means an additional context, a subsequent grid, a fresh perspective, etc.

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[13] Cf. Richard Rorty, *Contingență, ironie, solidaritate*, Romanian translation by Corina Sorana Ştefanov, Editura ALL, Bucureşti, 1998, pp. 141-148.

[14] Cf. Richard Rorty, *Cum evoluează pragmaticul*, in Umberto Eco, *Interpretare şi suprainterpretare*, Romanian translation by Ştefania Mincu, Editura Pontica, Constanţa, 2004, p. 86.

However, Rorty warns, an inspired reading is preferable to a methodical reading, ordered based on certain rules[15]. The former may even effect a change in one's conception of oneself, of one's abilities and of what one seeks to accomplish with oneself. Inspired reading is an encounter ("with an author, character, plot, stanza, line or archaic torso"). Respect for the author or the text is not a matter of respecting an *intention* or an internal structure. Inspired reading discards the technical rigours of modern consciousness and approaches, at least analogically, the manner of reading of Plotinus's disciples. They did not necessarily seek to identify themes, structure or concepts in old writings, but rather to become different themselves.

The free disposition in front of the text is openly celebrated by Jonathan Culler. He argues that is natural to offer oneself as much freedom as possible. To see oneself as free from the "text's intention" and from certain "cultural codes", from past decisions (for example, whether it is important or not "to find out how computer programs or natural languages or literary discourses work"). And above all to be free from certain ideologies (such as pragmatism, deconstructivism or even the kind of rationalism that asserts the "limits of interpretation")[16]. For ultimately, only certain language plays can reflect all these intentions, codes, ideologies. "It would be sad indeed if fear of 'overinterpretation' should lead us to avoid or repress the state of wonder at the play of texts and interpretation, which seems to me all too rare today, though admirably represented in the novels and semiotic explorations of Umberto Eco[17]". This latter thought is an encouraging and delightful one, urging us not to lose the sense of wonder of books and the power to enjoy the beauty of the unexpected.

As we can see, across the Atlantic, there is plenty of freedom, reflected by at least a few voices, in the exercise of interpretation and reading.

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[15] *Idem.*, p. 100.

[16] Cf. Jonathan Culler, *În apărarea suprainterpretării*, in Umberto Eco, *Interpretation and Overinterpretation*, pp. 106-111.

[17] *Idem.*, p. 113.

Alternative readings

I do not know why there is so much talk these days about multiple and different, only different readings. If readings of one and the same text are different, only different, it can induce a sense of total indeterminacy. We might think then that they are either indifferent or pointless. We are at once faced with the indeterminacy of the reading text and the indeterminacy of the act of reading. Nothing would be of any worth as a significant, distinct reading or as interpretation.

Why wouldn't we rather be drawn to the idea of alternative readings? Not alternating, but alternative readings, correlated by virtue of their differences themselves. Although unequal in terms of their significance, they are no longer indifferent from each other[18]. This would enable the acceptance of the exercise of varied, even eccentric readings. It would also facilitate debating the degrees of acceptability of certain interpretations. Ultimately, "every picture of the world (be it a scientific law or a novel) is a book in its own right, open to further /readings and/ interpretation[19]". For example, Copernicus's book does not exclude from the game the older book of Ptolemy and does not cast it far from the eyes of a modern man. In other terms, "the force of the Copernican revolution is not only due to the fact that it explains some astronomical phenomena better than the Ptolemaic tradition, but also to the fact that it – instead of representing Ptolemy as a crazy liar – explains why and on which grounds he was justified in outlining his own interpretation[20]". Confronted with the alternative, one is no longer seized with the impulse to reject inflexibly and premeditatedly certain representations of this world.

In the case of philosophical writings, alternative reading, in this last meaning, offers a new perspective. You are then made aware that reading Wittgenstein, for example, does not render useless the reading of Wilhelm von Humboldt or of Augustine. Quite the contrary, the author himself could tell you in what respect and precisely how the view of the precursors was justified. This means that the representation of the world as palimpsest, as an inexhaustible, undated book, has not yet lost its powers of attraction on us.

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[18] I had in mind here the distinct meaning of the term "alternative" as employed in *Alternative experiences of truth*, in Teodor Dima & Dan Sîmbotin (eds.), *Knowledge and Action within the Knowledge based Society*, Editura Institutul European, Iaşi, 2011, especially pp. 50-55.

[19] Christine Brooke-Rose, *Istoria în palimpsest*, in Umberto Eco, *Interpretation and Overinterpretation*, p. 136.

[20] *Idem.*, p. 137.

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On “Being”, “Beings” and “Being”[*]

Livia Ionela BACIU

ABSTRACT: We want to emphasize in this paper the fact that above all the Thinker from Paltinis is a hermeneut. For this we chose three Romanian themes that Noica considered representative for the Romanian philosophy. We will also underline through these terms, some of the virtues of the Romanian language.

KEYWORDS: *nature, natures, being, ”nature's being”, “the nature within”*

Noica says: “if in our speech has arisen words and meanings that can enrich the human thought but it didn't appeared in the speech and the conscience of others, we are also indebted to give an account of them[1]”. What we want to clarify through this paper are the hermeneut qualities of the Thinker from Paltiniş. His constant concern was to demonstrate the existence of a Romanian philosophy; thisshows the fact that Noica was and remains above all, a philosopher of language. Seeking with work in the historical box of the Romanian words, the thinker discovers that some forgotten words are hiding in their core, some speculative ways that could bring something new or completely different concepts already entered in the universality, or it could compete with many other concepts. Emilia Guliciuc said about Noica: “He lives in the company of great concepts or the founder words of the

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[1] Constantin Noica, “Cuvânt înainte” la *Sentimentul românesc al ființei*, Editura Humanitas, București, 1996, p. 5.

Romanian language[2]". The philosopher was interested in his analysis, to determine the significance of the words, their biography, wanting throw these to learn their lesson. Arguing strongly that it is in the essence of the Romanian spirit to strive to something and be something. Any nation is *a closure that opens*, however the philosopher has always recognized that initially, we continue to be a folk culture, being convinced that "only in the words of our language does one happen to remember things that you never learned[3]". It is less known that Noica has always recognized that the main source of his inspiration for the *Romanian philosophical Utterance*, was the work signed by Vulcănescu: *The Romanian Dimension of existence.* We learn from Alexandru Surdu that Noica asked permission from Vulcanescu's wife to continue the work. The philosopher's request was that in a first step to not cite the name, only after the paper would be published. Surdu ranks the discussion chronologically in 1966; the dialogue witnesses were Constantin Floru and his wife (in whose house the event was spent), Virgil Bogdan and Alexandru Surdu. After being published in the journal *Chronicle* a series of these, about *the Romanian philosophical utterance*, would he unite in a book with the same title. Noica respected his given word, noting that the study conference of Mircea Vulcănescu, *The Romanian dimension of existence* indicating that without "its lesson" he wouldn't have been writing *The Romanian philosophical utterance*. The Philosopher Noica gave an important role to the evolution of the Romanian culture and also of Romanian philosophy; Noica's thoughts were not only shared by Vulcanescu but also by Surdu: "It was natural that the Romanian language, an essential element of the Romanian world was to be also a subject of philosophical reason and even a national design for the development of the Romanian philosophical systems[4]". Actually, not only has the Romanian culture given an important role to linguistics, it was worldwide attention, considering that the subtleties of a language give the skills of the thought.

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[2] Emilia Guliciuc, *Aporiile gândirii nicasiene*, Editura Didactică şi Pedagogică, R.A., Bucureşti, 1999, p. 178.

[3] Constantin Noica, *Rostirea filosofică românească*, Editura Humanitas, Bucureşti, 1987, p. 7.

[4] Alexandru Surdu, *Comentarii la Rostirea Filosofică*, Editura Kron-Art, Braşov, 2009, p. 23.

On the Romanian territory Mircea Vulcanescu was among the first to notice the virtues of the Romanian language. But the one who carried the Romanian heritage was the Thinker from Paltinis, his work *Word along the Romanian Speaking,* being the first authentic Romanian study of hermeneutics. Therefore we want to address in the present study, three Romanian terms that Noica considered indicative for the isotopes of Romanian philosophy; we refer to *nature, natures* and *being.*

For Romanian grammar, *fire-nature*, is an verbal abstract, made by the infinitive of the verb *to be* and the suffix *re,* the term *fire-nature* is a verbal noun; in the case of our language. The passing of the verb as a noun does not mean the passage to an abstract form but rather by using the long infinitive will lead in the Romanian language to the most concrete meanings.

Our hermeneut said that this form of "pass-use-conquest-thought-structure[5]" would be also possible in English with the gerund, even in French or German, but to us the things are simpler, because these infinitive forms are part from the ordinary language. The power to easily turn verbs into nouns by using the long infinitive is considered by the thinker from Paltinis one of the most significant virtues of the Romanian language. This reversal implies the shift from an abstract idea to a concrete situation. Almost every verbal noun describes in the Romanian language a concrete experience. The philosopher from Paltinis describes the communication situation in order throw the fact that in the act of knowledge, the mind meets first things, processes or undetermines things, states and then things, processes and then defined states. For example, if we see someone running, we will perceive a run first and then someone running. If for grammar the verbal noun *fire-nature*, denotes throw the infinitive verb *to be*, the abstraction; but the philosophical knowledge holds: "the summary of all real situations evoked by the verbal nouns in our language[6]", from a concrete situation, we place ourselves in generality; the reading for me becomes a primary experience of the mind.

From what we could tell until now, Noica concluded that the verbal noun *nature* express both the concrete generality and the concrete universality. Moreover and the Romanian language dictionary out of 1934, gives for *the nature* the same meaning: "nature considered as the sum of those found in it[7]". Of course that the dictionary cites some examples that match, such as: "Iarba că se vestejea, Piatra că se despica, Frunza'n codru jos cădea, Fireu'ntreagă că jelea"-Jarnik Bârseanu.

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[5] Constantin Noica, *Rostirea filosofică românească*, p. 34.

[6] Constantin Noica, *Rostirea filosofică românească*, pp. 35-36

Although *the nature* includes everything in *the nature within*, it fails to cover the entire reality. Let's see the example that Noica selected from the Romanian Language Dictionary: "Ființe carile nici în ceri, nici în fire se află". This is an example from Cantemir's prince who wanted to show by these the difference between the natural things and the transcendent things, the things from the heavens and the nature within, or a quote from Mineiul in the year 1776 which annoyed Noica: "Din fire Dumnezeu fiind şi cu firea om făcându-se". How can we interpret in this context the meanings of *the natures*. We can not say that the Divinity was born from *nature*, and at the same time He transformed in man also by *threads*. There are two posibilities: the first possibility or nature it refers to the superhuman nature of God or it taken in this context as a concept (as a concept would lose its concrete meaning and will became transcendent), only so, note Noica's *nature* could be an abstract verb, and could fit in this context the divine quality of God.

In Noica's view the notion of *nature* "is not all material being of the world. There will be neither its moral being. It's all living being and perceptible of the world[8]. The vocable *nature* is a concept as possible as concrete. There is both a human being, and a human nature, a weather one, a music one and so on. In the Romanian language the infinitive has the virtue of expressing the facts; nature tends to express all "creatures", in the world with all existence levels and also the internal types of determinants (biological, psychological, gnosiological, educational and cultural). The multiple meanings of *nature* show the diversity of the act of being. Although the verbal noun *nature* is *the natural* source of the things. It's not expressing the act of being, only throw *being* concluded the philosopher it can becoming into being.

Another meaning of *nature* is given by the Romanian language dictionary by 1934: "Nature as creative power is manifested in any creature". How every thing has its nature, nature is not anymore after Noica the universal concrete but becomes the particular concrete. *Nature* is like a genealogical tree; it is distributed in several beings. *Nature* concludes Noica is actually the reality, by nature is becoming and *the being* is the reality in the way that without it, we can't speak of becoming. The further researches that Noica made from the files of the Romanian language dictionary, from Tiktin Dictionary and also the meanings of some words from the ancient greek, led him to the opinion that between the two Romanian methaphysical terms: *nature* and *being* there is some interconnection. *Natures* has its origins into becoming rather than *being*, while the *being* embodies throw fieri-that means becoming.

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[7] ***, *Dicționarul limbii române*, Academia Română, Întocmit şi publicat la Îndemnul Maiestății Sale regelui Carol I, Tomul I, partea I, F-I, Monitorul Oficial şi imprimeriile statului, Imprimeria Națională, Bucureşti, 1934, p. 127.

[8] Constantin Noica, *op. cit.*, p. 37.

Opposed from *nature*, we find out from Noica and also from the Romanian language dictionary that the core of the word *being*, is not receving its meanings from literature. *Being* is becoming a contradiction: "at us the being isn't expressing more essence. That is the reason to be than the existence that is the act of being; it's not expressing more the virtual than the actual, the law than life, state of nature than being, the permanence than becoming[9]". Let's see how defined the Romanian language dictionary of 1934 is with the term of *being*. First we will cite some literary ways: the first way, to exist, to be (in being), having being;

„Un scriitor de hrisoave, se întâmpină între 1527-1538 sau 1544 la care dată ființa, o biserică, făcută de el". Iorga

2. ființi-Registrele nu ființesc. Uricariul, IV

3. being, existence, present.

Cu ființarea sa la Saxonia nu puțină frică au făcut în Europa. N. Costin, Let. II, 70[10]".

Other meanings and examples we will quote from the Romanian language dictionary of 1934:

- the existence way: Şi Dumnezeu ne-a scos din întunerec la lumină şi din neființă la ființă. Mss(a.1654), ap.
- to have being in the world: to be born, to exist, to be: Păgânii de la Dumnezeu au ființa. Biblia, 1688.

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[9] Constantin Noica, *op. cit.*, p. 42.

[10] ***, *Dicționarul limbii române*, Academia Română, Întocmit şi publicat la Îndemnul Maiestății Sale regelui Carol I, Tomul I, partea I, F-I, Monitorul Oficial şi imprimeriile statului, Imprimeria Națională, Bucureşti, 1934, p. 121

- nature, substance, being: Iar în Hristos n-au lucrat darul Duhului, ci Hristos cu duhul de a ființa fiind, au lucrat minunile. M.S.S(sec. XVIII).
- the negative way: non-being and not-existence: Lucrurile s-au făcut din neființă în ființă. Gavril. Nif.

The penultimate distinction bring up and the verb abstract *nature*, we are meeting at Mircea Vulcanescu the phrase composed by "the nature being". The philosopher states that the composed phrase "the nature being" has in its composition two assertions: the fact of being and the way of being[11]. The first type defines the most common use, the one thrown away which we attribute to *being* a feature; the second quality signifies the way of *being* of being, respectively the nature of the grammatical subject. Unlike Vulcanescu, Noica is much richer in meanings, identyfing, six cases on the "Romanian modulations of being", namely:

„N-a fost să fie
Era să fie
Va fi fiind
Ar fi să fie
Este să fie
A fost să fie[12]", throw these Noica wanted to emphasize that the Romanian speaking can be expressed through many ways of *being* and *not being*. The Romanian thought has the advantage of the existence of the verb to be, which allows the formation of various linguistics forms. The verb *to be*, can be easily used in modal logic. Regarding the verb to be Noica noted, while others languages require the creation of some special expressions, such as: *contincengy, possibility, impossibilty, necessity*. In our language we say, *is hapening, is possibile, is impossibile, is necessary*. In the Romanian language it is much easier to make linguistic forms. All the forms mentioned above are made with the verb to be: "ar fi să fie" which express the possibility. It is possible to be; n-a fost să fie expresses the impossibility; a fost să fie express the need; de-ar fi să fi, expresses something of the contingency order, with that "the", not in the subjective or the deliberative

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[11] Mircea Vulcănescu, *Dimensiunea românească a existenței*, Editura Eminescu, București, 1996, p. 179.

[12] Constantin Noica, *Sentimentul românesc al ființei*, Editura Humanitas, București, 1996, p. 28.

way, but in the objective way: if it happens to be[13]". If the verb to be is capable of so many modulations, results that both *being* and its modes, find its purpose in reality. The Romanian utterance inflections are ultimately as many levels of reality, possible in any language. Our intention in this paper was to remind to the readers, the hard work submitted by Noica, for the sake of our Romanian language.

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[13] Constantin Noica, *op. cit.*, p. 26.

*Specifications: We translated the word *fire*, with *nature*, depending on context we used just once *threads*, because of the context. We tried to not create contradictions between the two Romanian words *fire* and *ființă*.

Is Collective Memory a Figment of the Imagination? Reflections on the Scope of Memory in the Public Sphere

Jeffrey Andrew BARASH

ABSTRACT: During the decades following the pioneering work of authors such as Walter Benjamin or Maurice Halbwachs in the 1920s and 1930s, it has become increasingly common to refer to memory not only as a source of personal identity or of the identity of small groups, but also of large collectivities. If in recent years an ever growing number of studies in a variety of disciplines employ the concept of collective memory, my purpose in analyzing this concept in the paper that follows will not be to provide a survey of the ways in which it is employed, but to investigate its precise meaning in the methodological perspective of philosophy. I will examine what we mean when we refer to "collective memory", and the role of imagination as a source of collectively remembered, a communicable experience.

My aim will be to elucidate the way in which collective memory might be demarcated from constructs of the imagination, above all in the public sphere.

KEYWORDS: *Collective memory, symbol, public memory, imagination, Husserl, Cassirer, Chateaubriand*

During the decades following the pioneering work of authors such as Walter Benjamin or Maurice Halbwachs in the 1920s and 1930s, it has become increasingly common to refer to memory not only as a source of personal identity or of the identity of small groups, but also of large collectivities. If in recent years an ever growing number of studies in a variety of disciplines employ the concept of collective memory, my purpose in analyzing this concept in the paper that follows will be less to provide a survey of the ways in which it is employed than to investigate its precise meaning in the methodological perspective of philosophy. I will examine what we mean when we refer to "collective memory", and the role of imagination as a source of collectively remembered, a communicable experience. My aim will be to elucidate the way in which collective memory might be demarcated from constructs of the imagination, above all in the *public* sphere.

Upon initial examination, the concept of "collective memory" presents an immediate difficulty as soon as we attempt to clarify it. According to its primary signification, remembrance is carried out in the original sphere of the self. In a strict sense, collectivities never "remember" any more than they have an autonomous, substantial being. And yet, members of a community, as vast as it may be, may share remembrances of what can be publicly communicated through word, image and gesture. In the public sphere, however, it is not generally possible to convey what memory recalls in an immediate personal experience: people and things, events and situations as they actually present themselves in a direct encounter or, so to speak, "in the flesh". My understanding of this term draws on phenomenological theory, and above all on that of Edmund Husserl, who equated original experience with what he termed experience in the flesh in a given living present ("leibhafte Erfahrung in einer jeweiligen lebendigen Gegenwart")[1]. Other persons, as Husserl explained, present themselves to us "in the flesh". In a precise sense, this signifies that their bodies, movements, and gestures are displayed to us and it is by this means that we gather their inner thoughts and feelings in a secondary manner. Moreover, the term, "in the flesh", *leibhaft*, is also applied by him to other things in the world as to the givenness of the surrounding world itself. If photographs, paintings or descriptions may revivify these encounters or publicly relate them through signs, images or gestures, they can never replace this primordial capacity which is unique to remembrance in the original sense. Let me illustrate this by means of a brief example.

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[1] See for example: Edmund Husserl, *Zur Phänomenologie der Intersubjektivität. Texte aus dem Nachlaß*, Zweiter Teil, 1921, p. 28; Iso Kern (ed.), Den Haag, M. Nijhoff, 1973; *Husserliana*, vol. 14, pp. 278-79.

To elucidate what might be termed experience “in the flesh”, it will be helpful to draw on the kind of account that is best portrayed in literature. A particularly vivid example of such an encounter is provided by François-René de Chateaubriand in his *Mémoires d’outre-tombe*, an autobiographical memoir composed in different periods of the author’s life and modeled along the lines of a confession, in which he proposed:

> “to account for myself to myself […]; to explain my inexplicable heart, in seeing finally what I will say once my pen abandons itself without constraint to all of my recollections[2].

With this aim in mind Chateaubriand, in an early chapter of the work, recalls his experiences as a young man when, in the early 1790s, he embarked on a voyage to the New World. After he arrived in Philadelphia he was invited to the home of George Washington, the first President of the United States, who was in Philadelphia at that moment. And Chateaubriand recounts their first meeting, before seeing him the next day at a dinner to which he was invited in the President’s modest residence: “large in size, appearing calm and cold rather than noble, he resembles his portraits”. And, regarding the dinner in the presence of Washington and of a small number of his friends, Chateaubriand relates that while the President was “at his brilliant apogee”, he himself was completely unknown; “I was happy, however”, as he writes, “that his gaze turned toward me! I felt enheartened by this encounter for the rest of my life![3]”.

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[2] “[…] j’écris principalement pour rendre compte de moi à moi-même […] je veux […] expliquer mon inexplicable Coeur, voir enfin ce que je pourrai dire lorsque ma plume sans contrainte s’abandonnera à tous mes souvenirs”; <<<IS THIS THE CORRECT BEGINNING? Chateaubriand’s account of the aim of his work is found in his first description of it which is preserved in the form of a manuscript in the archives of Combourg, France; see in this regard the introduction to the Pléiade edition of this work written by Maurice Levaillant in François-René de Chateaubriand, *Mémoires d’outre-tombe*, vol. 1. Gallimard, éditions de la Pléiade, Paris, 1951, p. x-xi. Unless otherwise indicated, all translations are my own.

[3] “[…] d’une grande taille, d’un air calme et froid plutôt que noble, il est ressemblant dans ses gravaures; “[…] il était dans tout son éclat, moi dans toute mon obscurité; heureux pourtant que ses regards soient tombés sur moi! je m’en suis senti

Another example, this time a visual representation, will serve to complement Chateaubriand's reminiscence. In roughly the same period as Chateaubriand's visit to Washington, the United States Congress commissioned the French sculptor Jean-Antoine Houdon to fashion a marble representation of the first President of the United States. He made the trip from Paris to the New World to create this and other sculpture representations of Washington. The works were done in Washington's presence at his residence in Mount Vernon, Virginia, where the one commissioned by Congress stands today. The candidness of expression and the imposing demeanor of Houdon's representation of Washington corroborate Chateaubriand's description of the statesman. But here we come to our principle point: in spite of the vividness of the evocations of Washington, conveyed to posterity with the talents of the writer and the sculptor, nothing permits us to recall the *original* encounter with Washington "in the flesh" which Chateaubriand and Houdon each experienced at different moments and which it is the primordial capacity of memory to recall.

In our contemporary world, such a limitation of original experience to direct personal encounters might, of course, seem hopelessly narrow. Nowadays, we have immediate ways of conveying encounters through radio and television, and we can watch video interviews with public figures long after they have ceased to exist. Nonetheless, these media, even if they are able to record events for an untold number of spectators and preserve them for a seemingly indefinite period in film archives, cannot replace direct encounters "in the flesh". Far from spontaneous encounters, even when they are, so to speak, "live", and not merely recorded, they are regularly organized or "staged", and they address a wholly *anonymous* mass audience with which there is only very rarely a possibility of interaction[4]. As such, any difference between "live" and "prerecorded" broadcasts becomes inessential, for neither is able to reproduce the direct personal quality and the unique aura characteristic of situations and events as they are experienced "in the flesh".

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echauffé le reste de ma vie!"; Chateaubriand, *Mémoires d'outre-tombe*, vol. 1, pp. 221-222.

[4] Niklas Luhmann, *Die Realität der Massenmedien*, Vs Verlag, Wiesbaden, 2004; Jane Feuer, "The Concept of Live Television: Ontology as Ideology", in *Regarding Television. Critical Approaches – An Anthology*, University Publications of America, Frederick, MD, 1983, pp. 13-16.

And, moreover, they are unable to reproduce the fullness of context in which such experience originally occurs. The cardinal importance that we attribute to such direct encounters is clearly illustrated by the role that we generally accord to eye-witness testimony in everyday experience. Of course, witnesses may, in certain cases, be mistaken or may even attempt to mislead us in their accounts. Indeed, to return to our previous example, George Washington's records of his meetings during the month when Chateaubriand was in Philadelphia, which do not seem to corroborate Chateaubriand's account, have led some commentators to question the reality of this encounter, or at least the sequence of events as Chateaubriand recorded them in his work *Mémoires d'outre-tombe*.[5] In this regard, we can in no way exclude the possibility that further evidence might be uncovered at some future date proving that what Chateaubriand claimed to be an encounter "in the flesh" was in fact nothing more than a product of his literary imagination.

Beyond the possibility, however, of mistaken testimonies or those which intend to invent or mislead reports of direct encounters, are themselves manifestly of different kinds: eye-witness experience by passive bystanders presents a very different perspective than that of active participants in events, especially in violent or traumatic situations, such as war or other similar occurrences. Involvement in traumatic situations has been associated with well-documented forms of memory loss and, in extreme cases, with aphasia[6].

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[5] For an account of debate on this question, see the commentary by Jean-Claude Berchet in the footnotes of the Garnier edition of *Mémoires d'outre-tombe*, vol. 1., Garnier, Paris, 1989, pp. 739-740, where the editor suggests that Chateaubriand probably did encounter Washington, although he perhaps simplified the sequence of events in harmony with the structure of his narrative.

[6] In this regard, a useful distinction has recently been made between what has been termed "eye-witness" and "flesh-witness" narratives. This distinction accounts for the difference between events witnessed by parties who are not themselves involved in recorded interaction and "flesh-witness" narratives by those who directly participate in the events. The concept of "flesh-witnessing" is particularly important in accounting for the difficulty of translating direct experience of traumatic events into readily representable categories. See in this regard the insightful issue of *Partial Answers*, edited by Leona Toker, on eyewitness narratives, and in particular the articles by Yuval Noah Harari, "Scholars, Eyewitnesses, and Flesh-

With all of these situations taken together, the fact that we can represent fictive constructions as real events, or that all sorts of imaginative constructions may lead us to distort the recollection of "in the flesh" encounters, and traumatic experiences to repress them, encourages us to exercise great caution when it comes to interpreting such accounts. Here we must allow, not only for the possibility that purely fictive creations may be represented as experienced "events", but also for the fact that experienced events themselves are always perceived in a particular perspective and are necessarily reconstructed through interpretative acts, raising the possibility that, following the occurrences themselves, they may be subject to voluntary or unwitting re-elaboration, distortion or suppression. Given the diversity of perspectives and the role of interpretative acts in the reconstruction of past experience, it would therefore be naïve to claim that encounters in the flesh directly register the "reality" of events themselves, beyond the interpretative reconstruction of the viewer. And yet, in spite of this obvious limitation, eye-witness representations correspond to fundamental and irreplaceable kinds of experience. Far from recapitulating "reality" in some absolute sense of the term, they must constantly be complemented and corrected by other testimonies, which is why the comparison of numerous testimonies by different witnesses, and their fit within the pattern of events, remains the most reliable way to reconstruct the factuality of past occurrences. And here, not only in our everyday behavior, but also for the work of the judge or historian eye-witness reports are accorded a role of particular importance[7].

In certain exceptional situations, publicly significant events may be experienced as encounters "in the flesh", but only rarely and by a very small minority of remembering individuals who witness them directly. Even in such cases, direct experience of a given event does not necessarily entail comprehension of its *publicly* significant scope. In such instances, the unbridgeable gap between the recollections of individuals or of members of

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Witnesses of War: A Tense Relationship" and Sarah Liu, "The Illiterate Reader: Aphasia after Auschwitz", *Partial Answers*, 7, 2, 2009, pp. 213-228 and pp. 319-342.

[7] See in this regard the insightful analysis of this theme by Renaud Dulong, *Le témoin oculaire. Les conditions sociales de l'attestation personnelle*, Editions de l'Ecole des Hautes Etudes en Sciences Sociales, Paris, 1998; on the concept of the witness, see also the classic study by C. A. J. Coady, *Testimony: A Philosophical Study*, Clarendon Press, Oxford, 1992.

small groups and what might be termed "public memory" in the sphere of vast collectivities might well lead us to question the legitimacy of any application of the concept of "memory" to the public sphere as such. Large-scale public commemorations, indeed, almost always recall what is beyond any possibility of remembrance by those who participate in them since, for example, the foundation of a State or the occurrence of other politically significant events most frequently lie beyond the possibilities of what any living individual might have experienced and remembered. In all such commemorative ceremonies, as in any form of representation of publicly constituted collectivities, such as national groups, it might seem more just to refer, not to "collective memory", but to images that are products or "figments" of the imagination. It is this consideration which has led numerous theorists of the social world to follow the lead of Benedict Anderson in his book *Imagined Communities*, for whom such vast collectivities are "*imagined* because the members of even the smallest nation will never know most of their fellow members, meet them, or even hear of them, yet in the minds of each lives the image of their communion[8]". As a means of accounting for collective identity and group cohesion on a vast scale, insofar as it is rooted in the reminiscence of a shared collective past, this recourse to the term "imagination" permits us to avoid the dilemma that the concept of "collective memory" would seem to introduce, since imagination as a capacity to maintain and revivify an "image of communion" on a large scale in no way requires that we invoke the most original feature intrinsic to remembrance of past experience, which is to have encountered what is remembered "in the flesh".

Admittedly, however, the term "imagination", as it engenders such "images of communion", raises another kind of difficulty since, indeed, this terminology might seem to blur any distinction between an interpretation of social cohesion which traces its source to blanket fantasy or fiction and one which admits that, if social cohesion draws on the imagination, it may also lay some claim to a basis in a "remembered" past, even where recollection is indirect and borrowed from past experience reported by others. We may, of course, deny the importance of such a distinction and claim, with Nietzsche, that all viable social existence and political cohesion depend upon roots in the mythical *Heimat* and mythical maternal bosom[9]. Indeed, as Nietzsche well appreciated, it may in many instances prove more in keeping with the requisites of a healthy vitality – and certainly of group contentment – to forget what is bothersome in the past or to recreate it along the lines of fiction. In referring to remembrance of the historical past, Nietzsche therefore frankly suggested that it is only when historical narrative is reframed as a "pure work of art" that it may sustain or even awaken vital instincts[10]. However, our experience with the political myth of the most sinister kinds in the 20th century necessarily leads us to moderate Nietzsche's radicalism at least in distinguishing between different varieties of myth on which collectivities may be founded, and here the delicate question of the relation of imagination to what is held to be a remembered past – even a past which has been remembered and related by others – must once again be asked.

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[8] Benedict Anderson, *Imagined Communities*, Verso, London, 1991, p. 6; Aleida Assmann begins her investigation of the legitimacy of the concept of collective memory with the question: "Kollektives Gedächtnis – eine Fiktion?" and she then gives cogent reasons for answering this question in the negative. Aleida Assmann, *Der lange Schatten der Vergangenheit. Erinnerungskultur und Geschichtspolitik*, Beck, Munich, 2006, pp. 29-31.

To a large extent this question is of a semantic order. Ordinary language refers to "memory" or to "imagination" as if they were clear-cut and separate functions whereas, even in immediate personal experience, they play multiple roles and are always interconnected. Far from designating simple operations, the words "memory" and "imagination" cover a whole range of capacities. A few cursory examples will suffice to illustrate this point.

In the original sphere of intimate life, the verb "to remember" is indifferently applied to very different kinds of experience, for I can remember a fantasy I have had, as I can recall all sorts of persons, events or situations I am convinced I have experienced. On another level, I can remember an algebraic formula or how to ride a bicycle, just as I can remember how to do all sorts of things I have acquired by learning, both purely intellectual and more corporeal and physical. The single term

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[9] Friedrich Nietzsche, *Die Geburt der Tragödie*, § 23 Reclam, Stuttgart, 1993, p. 141.

[10] "[...] Nur wenn die Historie es erträgt, zum Kunstwerk umgebildet, also reines Kunstgebilde zu werden, kann sie vielleicht Instinkte erhalten oder sogar wecken". Friedrich Nietzsche, "Vom Nutzen und Nachteil der Historie für das Leben", *Erkenntnistheoretische Schriften*, Suhrkamp, Frankfurt am Main, 1968, p. 59.

"memory" clearly covers a whole range of possible experiences, actual or fictive, sensuous or intellectual, passive or active.

In a similar manner, the word "imagination" covers a whole range of connotations, which ordinary discourse rarely distinguishes in an explicit manner. We generally recognize the work of imagination in the production of fictive events – the so-called 'als-ob Erlebnisse' – as also in the more incoherent flights of fantasy. From a theoretical point of view, the phenolmenological research of Edmund Husserl has emphasized the fundamental role of imagination at the heart of perceptual acts. Where perceived objects always present themselves partially in a given field of view and always from a given standpoint, it is imagination, he explains, in an act of "fulfillment", which permits its identifycation as a meaningful whole. Still another fundamental capacity of the imagination is identifiable in what might be termed its *deliberative* capacity[11]. It is this activity of imagination which permits us to localize past events in memory and place them in temporal sequence. If I have lost a key or implement, I may apply this deliberative capacity of the imagination to envisaging all of the places where I might have inadvertently dropped it in order to find it once again. It would reach beyond the scope of this present paper to examine this topic in detail, which has been interpreted from different theoretical standpoints since Aristotle, Hume, Kant, or Husserl, to name only the best known interpreters. I will limit my comments to the collective sphere and remark that here too, if we are to interpret collective remembrance by vast groups in public life, it is necessary to precisely identify its relation to "imagination".

How might we understand the role of imagination in the realm of collectively remembered, a publicly communicable experience? Certainly fantasy and myth play a central role at all levels of social existence but, as I interpret it, the social bond is not simply based on imaginary creations, for it must be traced to a more fundamental function of imagination in the communal sphere, which interweaves the very fabric of communal cohesion. Imagination in this sense is a precondition for social existence *per se* and, as such, configures the basis for all that is communally significant. This primordial role of imagination, as I interpret it, while distinguishing it from all other connotations of the term, renders what is collectively significant communicable by embodying it in *symbols*. If I identify this work of symbolic embodiment, however, with an act of the imagination, it is not imagination conceived as an abstract function, but as part of a fundamental anthropological unity in which memory is primordially intertwined. In the collective sphere, on the basis of this original unity, a fund of remembered significations are patterned through the imagination in the form of communicable symbols. And here the matters suddenly become more complex, for one's imagination, through this work of embodying communicable symbols, lies at the source, both of group fantasy and fiction and of what is accepted to be a communally significant reality.

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[11] In *De Anima* (434a) Aristotle already clearly distinguished between a sensuous imagination (✳②✭✦+✲★★❹ ✦✳✳✲✳✭✱✳) common to humans and other animals, and a deliberative imagination (✳✷❁✶⅄❁✲★★❹ ✦✳✷✲✳✭✱✳), which only humans possess. For Goethe, imagination takes on a further sense as a capacity to distinguish the "truth of reality" or, as Goethe remarked in a comment to Eckermann, a "Phantasie für die Wahrheit des Realen"; *Eckermann Gespräche mit Goethe in den letzten Jahren seines Lebens*, Insel Verlag, Frankfurt am Main, 1987, p. 154. See above all in this vein Ernst Cassirer's interpretation of Goethe and this faculty of the imagination in *An Essay on Man. An Introduction to a Philosophy of Human Culture*, Yale University Press, New Haven, 1992, pp. 204-206.

To clarify this primordial role of imagination, we must provide a precise conception of the *symbol* that we are employing. Symbols have most often been interpreted in two different ways in accord with two long-standing traditions: first, in the narrow sense where the symbol represents by virtue of sensuous images what lies outside of possible sense perception – the lamb, for example, as it symbolically represents the person of Christ or the flag as it stands for a given nation; second, in the broader sense which includes in the symbolizing function representational images, language and gesture more generally[12]. For our purposes in interpreting collective memory, this distinction is of secondary importance, since both of these conceptions of the symbol deploy an identical act of imaginative association: indeed, the first and narrower interpretation of the symbol, as representing what is absent in experience, presupposes and extends beyond the scope of experience the essential function that the broader interprettation of the symbol engages: its work as a collectively-mediated organizing principle through which experience is endowed with a communicable sense. All symbols perform this minimal task, since they are all engaged in the transmission of publicly communicable experience through the activity I term "symbolic embodiment". According to this interpretation, it is *symbols* which confer spontaneous sense on experience by lending it communicable order at the primary level of its organization and articulation. Symbols lend a communicable order to experience by patterning it in terms of spatial, temporal, or numerical and other conceptual relations[13]. Symbolic embodiment renders communicable direct experience as it is remembered "in the flesh", long after the person or group who initially remembered it exists to recount it in person; symbolic embodiment also sets fictional or mythical creations in communicable form.

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[12] For a more detailed examination of the theoretical background and implications of these two ways of interpreting the symbol, see my essay "Was ist ein Symbol? Bemerkungen über Paul Ricoeurs kritische Stellungnahme zum Symbolbegriff bei Ernst Cassirer", *Internationales Jahrbuch für Hermeneutik*, G. Figal (ed.), 6, 2007, pp. 259-273.

And here we come to the crux of the matter. If the work of symbolic embodiment renders communicable both what we take to be fiction and what we take to be reality, both fantasy and remembered experience, what permits us to distinguish between these two realms? The most common answer given to this question is drawn from our everyday ways of making such a distinction, based on our capacity to reinsert what is purported to have been experienced into the broad context or web of reported events – including events in which we ourselves have participated and which we may have forgotten – in order to test the coherence of its fit within this larger web. Here Edmund Husserl's principal criterion for the distinction between remembered and fictive events proves particularly helpful. In theoretical discussions concerning time and temporal consciousness, Husserl elaborated on the distinction between remembered experience and fiction, and he remarked that remembered experience is characterized by its fit within the larger web of *temporal* relations to which all experience is necessarily bound. Fiction in a general sense, as he stipulated, is unrelated to this real temporal order and, where it displays temporal structure, it does so in a separate or – to use Husserl's term – a "quasi-time" (*Quasi-Zeit*)[14]. Whereas what we take to be the reality of temporal events depends on our ability to fit them into the larger series of temporal relations in an overarching dimension of experience; such temporal relations have little significance for fictive events which take on significance in relation to the fictive temporal worlds that they construct. Following this line of reasoning, if I am able to determine that something is fictive, it is because, in an immediate sense, I find a discrepancy between a fictive event and the spatio-temporal and conceptual order in which it purports to fit. It is evident that in eye-witness testimony, an account which claims to have perceived something which goes against the logic of the spatio-temporal order is discounted, for if a certain person was seen by a large number of people at a given time in a given place, it is impossible for him/her to have been in another place at the same time.

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[13] My approach to the symbol is in part inspired by the thought of Ernst Cassirer. What I have borrowed from him concerns less the theory of symbolic forms that he presented in the three volumes of his *Philosophy of Symbolic Forms* than what he conceived to be the "primordial forms of synthesis" (*Urformen der Synthesis*) – space, time, and number – for which symbols provide the ordering principle. See Ernst Cassirer, *Philosophie der symbolischen Formen*, vol. 3, Wissenschaftliche Buchgesellschaft, Darmstadt, 1994, p. 17. It would reach beyond the framework of this paper to provide a detailed discussion of this theme.

Here, however, we must go a step further and specify that this "fit" within the web of events depends precisely on the prior organization of this web in relation to a symbolic order – or better, symbolic "orders" – which the public sphere presupposes. It is here, indeed, that the possibility of re-inserting events into the web of the past presupposes the symbolic character of temporal, spatial, or conceptual relations in terms of which it is organized. It is symbolically mediated in the sense that there is no experience in the abstract and that, as Ernst Cassirer pointed out, even what are taken to be the most basic kinds of spatial or temporal perception and its concrete conceptual elaboration, this presupposes the work of symbolic embodiment insofar as concrete unities are isolated within the flow of experience and treated as equal or unequal quanta, of greater or lesser intensity, belonging either to uniform processes or to different and incomparable orders, such as the sacred and the profane, the utilitarian and the aesthetic, the good or the reprehensible. In all such situations, we invest them with a symbolic sense through which they may be meaningfully communicated to others and in terms of which possibilities of their coherent fit into the web of reality may be explored. It is in this specific sense, therefore, that imagination shows itself to be intrinsic to the public construction of reality, but it is not for this reason that such constructions are "imaginary".

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[14] Edmund Husserl, *Die Bernauer Manuskripte über das Zeitbewusstsein* (1917/18), *Husserliana*, vol. 33, Rudolf Bernet und Dieter Lohmar, Kluwer (ed.), Dordrecht, 2001, pp. 327-354; see also in this respect Edmund Husserl, *Erfahrung und Urteil. Untersuchungen zur Genealogie der Logik*, Meiner, Hamburg, 1985, pp. 184-207.

This idea may be illustrated more clearly if we briefly examine the most ubiquitous of all prerequisites of experience – that of time perception. In dealing with time we must be wary of the categories of ordinary language, which when referring to "time" in the singular, immediately lead us to interpret it as an autonomous, uniform medium of experience. We must employ the philosopher's skepticism concerning the persuasive power of ordinary language and inspect more closely what we mean by "time" and the "temporal web" of events. Unless we presuppose that time exists primordially as an undifferentiated *durée* in the sense of Henri Bergson which, as such, can be the basis of no articulation and of no communication, temporal relations, as soon as they are brought to awareness and divided into numerical units, are necessarily mediated by *symbols*, for they are always ordered according to some communally intelligible numbering system. Such temporal relations are further charged with symbolic meaning when they are fit into the web of time in calendar form, be it in the Christian, Jewish or Moslem frame of temporal reference. To be remembered and publicly communicated, all events that are placed in a temporal web of relations depend on imagination in its fundamental way of situating them in the symbolic order to which they are bound. To frame this idea in more technical philosophical terms: what Kant took to be the uniform schematizing work of pure imagination in the early part of the transcendental analytic of the *Critique of Pure Reason*, is more comprehensively characterized – without any necessary recourse to the Kantian or neo-Kantian epistemology and its reference to the uniform transcendental subject as the source of all meaning-constituting acts – as the work of symbolization in its broadest sense, through which embodied symbols schematize experience by organizing it, at its most fundamental level, in terms of concrete, collectively mediated modes of interpretation. It is in terms, therefore, of its concrete symbolic structure that we must conceive of the possibility of distinguishing between fiction and reality in the public world of interpretable events, persons, and things. It is in terms of this possibility also that we may approach a past which lies beyond all contemporary memory – the remote memory borrowed from the testimony of others and attested by their traces.

Insofar as it speaks to us at all, it does so from out of a network of embodied symbols in relation to which we may interpret its real or fictive character. This fund or network of embodied symbols, prior to any codified tradition or historiographical elaboration, is what I term collective memory, with which the self-interpretation of groups in each successive present must grapple.

In the final analysis, the demarcation of the "place" of collective memory at the different levels of its articulation depends on a precise interpretation of what we mean by the "web" of experience in which memory is entangled. As we mentioned at the beginning of this essay, Edmund Husserl, when it came to interpreting experience "in the flesh", never limited such experience to isolated persons or objects, but related it above all to the immediate givenness of the broader horizon against which they are apprehended. This observation is of cardinal importance for our conception of the "web" of experience, even if we step beyond Husserl's phenomenological orientation in conceiving of it primarily in its symbollically incorporated and collectively communicable form. This web or context, which is the horizon of all experience in the flesh, sets the background for acts of symbolic incorporation and communication, and it remains for the most part implicit. In the framework of the collective experience of large groups of contemporaries, such experiential horizons are for the most part taken for granted, although they may be made explicit for purposes of clarification to those who are not immediately familiar with them. Moreover, even where experience is only indirect and not based on encounters "in the flesh", as is the case in most public experience, such broader contexts are largely implicit and are not usually communicated. The gradual demise of contemporary generations leads not only to the loss of their living remembrances, but also to the complex plenitude of the larger context of experience, for this also quickly fades. Over time, the interprettation of this web or context may well become problematic. Through painstaking efforts of interpretation and imaginative reconstruction, historical research can to a certain extent revivify this context, but the results are always fragmentary and incomplete.

In his work on war monuments, Reinhart Koselleck has given a noteworthy example of the way in which the interpretability of a past symbolic context may fade over the course of a few generations. Here it is not simply a question of isolated images, but of entire experiential horizons constituting the publicly meaningful web which collective memory symbollically articulates. As Koselleck writes:

> “[the] identities that a monument aims to evoke are obliterated, in part because the sensuous intelligibility of the language of forms they manifest disappear; in part because the uniquely patterned forms begin to speak another language than that they were initially intended to convey [...] Without reference to captions or to empirically verifiable reference signals, the original signifycance of innumerable monuments can no longer be comprehended[15]”.

If we extend this example beyond the province of symbols in the narrower sense that war monuments incorporate, and apply them to language more generally, then we may add that linguistic mutations are not only the result of changes in the definition of given words. They often indicate shifts in experiential contexts as a whole. Here the experiential horizon in which language is interwoven undergoes transformation. As they gradually reach beyond the grasp of collective remembrance, we tend to forget how radical these shifts may be. As the implicit basis of symbolically incorporated and communicated experience “in the flesh”, this concrete horizon of experience is for the most part inconspicuous and, following the disappearance of living collective remembrance, is particularly difficult to interpret. In conclusion, I would like to illustrate this idea of the link between living collective memory and its corresponding experiential horizon – and the temporal variability of this link – by means of an example. I refer to the autobiographical reflections of the important, but now nearly forgotten writer, Jacob Picard, who wrote several volumes of short stories about the Jews living in the southwest German region of Baden in the late 19th and early 20th centuries. Picard, following his emigration to the United States during World War II, returned to Germany after the war and died in the city of Konstanz in 1967. His autobiographical writings include family reminiscences that had been orally communicated to him, reaching back to the period of the Napoleonic wars of the early 19th century. In the course of his recollections, he recalls his visit in 1936, as one of the few remaining members of its Jewish community, to the place of his birth in the small town of Wangen on the Constance Lake. In reflecting on the dialect spoken in this region, he relates the following episode:

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[15] “[die] Identitäten, die ein Denkmal evozieren soll, zerrinnen: teils weil sich die sinnliche Empfangsbereitschaft der angebotenen Formensprache entzieht – teils weil die einmal gestalteten Formen eine andere Sprache zu sprechen beginnen als ihnen anfangs eingestiftet war [...] [O]hne Rekurs auf Inschriften oder empirisch einlösbare Verweisungssignale sind zahllose Monumente nicht mehr auf ihre erste Bedeutung hin erkennbar; R. Koselleck, "Kriegerdenkmale als Identitätsstiftungen der Überlebenden” in *Identität*, Hg. Odo Marquardt, Karlheinz Stierle, Fink, München, 1979, pp. 274-275.

> “The language we spoke together was the so called Yiddish (Judendeutsch), that was nothing other than what today the non-Jews in the Rhine, the Main, and lower Neckar river areas speak, the language indeed of the Franks, which the Jews throughout western Germany spoke. Naturally, we evidently also conversed in Alemanisch, the dialect of our closest neighbors in town, in our daily dealings with them. This was heavily permeated by words and concepts of the old language of the holy books, which in their secular pursuits, our coreligionaries employed from time immemorial, and which, in isolated phrases, the non Jewish inhabitants had also come to use over the course of centuries of life together in this area. As I returned to my native region in 1936, before leaving it forever, and met on a road in the hills an acquaintance from childhood, Alfred Wolf, who was still permitted to drive through the territory in his old car to carry on his small business, he invited me to get into the vehicle in order to tell me the following with a laugh: he had visited the village of Worblingen, at about one hour’s distance, which Jews had no longer inhabited for more than twenty years, and greeted a farmer he knew there in the hope he might be able to sell him something. The farmer answered his greeting as follows: ‘It is good Wolf, that one of you has come back, since I have completely forgotten the Hakaudesch dialect.’ And Alfred was never a liar, the poor man; he was deported to Gurs in 1940 and has never been heard of since[16]”.

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[16] “Unsere Sprache war unter uns das fränkische sogenannte Judendeutsch, die nichts anderes war als das, was heute noch von den Nichtjuden am Mittelrhein, am Main und unteren Neckar gesprochen wird, die Sprache der Franken eben, die von den Juden überall in Westdeutschland gesprochen wurde. Aber vor allem sprachen wir als selbstverständlich die unserer engsten Nachbarn im Dorf, das Alemannische, wenn wir mit ihnen den täglichen Verkehr hatten; freilich war sie durchsetzt stark mit Worten und Begriffen der alten Sprache aus den heiligen Büchern her, die seit je für das profane Leben von unseresgleichen gebraucht worden war, ja,

In this narrative we find a moving reminiscence, not only of individuals and of regions, but above all of a noteworthy shift in experiential horizon, that the disappearance of community and its dialect involved. This community has disappeared, and we can commemorate it and carry out historical investigations in regard to its previous existence. Living collective remembrance of it, however, exists only in a metaphorical sense.

My purpose in relating the concept of collective memory to the symbol through the work of imagination has been twofold: first, I have argued that "memory" on a collective scale corresponds precisely to what can be symbolically embodied and communicated; second, I have stipulated that collective remembrance in the public sphere depends upon imagination for translation into symbolic expression, yet it is not for this reason simply imaginary. Only the skeptic can deny the nuances between different articulations of the imagination and, in view of ever-present possibilities of distortion and manipulation, invariably treat remembered experiences that are communicated among vast groups as so many *fables convenues*.

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gesprochen in einzelnen Worten, auch von den nichtjüdischen Bewohnern aus dem Jahrhunderte langen Zusammenleben her. Als ich im Jahre 1936 in die Heimat zurückgekehrt war, bevor ich sie für immer verließ und eines Tages auf dem Höhenweg den Jugendgenossen Alfred Wolf trat, der noch mit seinem bejahrten Auto durch die Gegend fahren durfte, um seinen kleinen Warenhandel zu treiben, hieß er mich einsteigen, um mir folgendes lachend zu erzählen: er hatte das etwa eine Fahrstunde entfernte Worblingen besucht, wo seit zwanzig Jahren keine Juden mehr wohnten und einen bekannten Bauern begrüßt in der Hoffnung, der werde ihm etwas abkaufen, und dessen Begrüßensworte waren: 'Guet, Wolf, dass wieder amal aner von Eich kummt, me verlernt sei ganz Loschen Hakaudesch.' Und Alfred ist nie ein Lügner gewesen, der Arme; er wurde 1940 nach Gurs verschleppt, und ist verschollen"; Jacob Picard, "Erinnerung eigenen Lebens", Werke, vol. 2, Faude, Konstanz, 1991, pp. 180-181.

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Sfera Intelligibile Nella Tradizione Platonica

Viorel IGNA

ABSTRACT: The concept of the «intelligible sphere» appears for the first time in Plotino. The sphere of the Spirit and of the Soul form two circles that originate from the One, which, in its turn, deploys in them, and there appears something like totality but nevertheless doesn't remain fully disclosed. The author tries to make clear an ontological-metaphysical meaning of the circle or the sphere as the fundamental feature of the Being, completion of the thought as well as the eternal dynamism of the subsistent nous. The thought of Plotino, according to which the One is totally present in every intelligible reality and establishes the infinite multiplicity of the intelligible sphere inside of the unity of the One, is continued by Porfirio, who, in the Comment for the Parmenide of the Platone, will make a remarkable interpretation of the «symbol of the mystical geometry» from a metaphysical point of view.

KEYWORDS: *Plotinus, intelligible sphere, nous, Neo-Platonism*

La sfera intelligibile (sfaira noete' / sfera intelligibilis) così come ha rimarcato Werner Beierwalter[1], fa la sua prima comparsa in Plotino: «Se essi sono stati spinti a odiare la natura corporea, perche' hanno udito spesso Platone[2] rimproverare al corpo di essere un ostacolo per l'anima e dire che ogni corpo e' una cosa inferiore, essi dovrebbero privare [5] col pensiero l'universo [del suo corpo] e vedere che rimane: una sfera intelligibile che contiene in se' la forma del mondo, le anime che le danno, fuori di ogni corporeita', una grandezza proporzionata e le estendono nello spazio conforme al modello intelligibile, cosi che il mondo prodotto si eguaglia per grandezza alla potenza, quella sensibile nella estensione»[3] (Enn. II, 9, 17, 5). E il seguente passaggio plotiniano: «Anche il mondo intelligibile e' molto piu' unitario, altrimenti ci sarebbero due mondi sensibili, divisi allo stesso modo, e la sfera intelligibile sarebbe assolutamente eguale a quella sensibile, se avesse la stessa unita' di questa» (Enn. VI, 5, 10, 44)[4].

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[1] Beierwaltes Werner, *Proklos. Grundzuge seiner Metaphysik*, Frankfurt (Klostermann) 1965, trad. It. Proclo. I fundamenti della sua metafisica, introduzione di G. Reale, traduzione di N. Scotti, Milano, 1988, 1990, p. 229.

[2] Plotino, "Fedon", (65A.10), in *Grandi filosofi*, Il Sole 24 ore S.p.a., Milano, 2004, p. 526.

«La sfera dello Spirito, commenta Beierwaltes, e quella dell'anima costituiscono due cerchi che si originano dall'Uno, il quale, a sua volta, si dispiega in essi, e in essi presente come tonalità e, tuttavia, rimane in sé totalmente indischiuso. Come i raggi del circolo scaturiscono dal centro e tuttavia, a partire dalla circonferenza, si mantengano in relazione costante con il centro conducendo cosi la forma circolare in unita', allo stesso modo anche il «cosmo noetico» che scaturisce dell'Uno, nel suo essere dischiuso e' sempre ancora racchiuso nel Principio, grazie alla presenza in lui del Principio e grazie alla «conversione» (epistrofe') verso se medesimo: esse e' ri-voltato nel suo Principio. L'Uno si rivela essere, dunque, il centro che tutto rinserra (Kentron)[5], l'avvenimento che segna l'inizio dell'eterna conversione dello Spirito in se stesso e nel proprio fondamento. La luce dell'Uno si particolarizza nel diverso fino a risplendere nello Spirito come fondamento luminoso. Ecco perche il circolo dello Spirito e quello dell'Anima possono venire intesi come cerchi di luce che esistono grazie alla presenza della luce primigenia e sono in essa intelligibili»[6].

«In qual modo, dice Plotino, e che cosa dobbiamo pensare di Lui ch'e' immobile? Splendore tutt'intorno diffuso che emana, si, da Lui, ma da Lui che se ne sta fermo, come, nel sole, lo splendore che gli fa quasi un alone d'intorno; splendore che si rigenera, eternamente, da Lui, ch'e' fermo». (Enn. V, 1, 6, 27-30)[7].

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[3] Plotino, *Enneadi*, Rusconi, Milano, 1996, p. 321.

[4] *Idem.*, *op. cit.*, p. 1161.

[5] *Idem.*, pp. IV, 2, 17, 12, VI 5, 5, 18.

[6] W. Beierwaltes, *op. cit.*, p. 229.

[7] Plotino, *op. cit.* p. 803.

La sfera dell'intelligibile, commenta Beierwaltes, non e', dunque, altro che il radioso dispiegarsi del centro, dell'Uno, nel quale l'Uno, pur procedendo da se medesimo, persuade tuttavia in se' e, grazie al rifluire del circolo nel proprio principio, rimane presso di se'anche nella realta' derivata. Pertanto si puo' anche affermare che, nella realta' derivata, l'Uno sembra essere «sviluppato, vorrei dire, senza essere gia' svolto» [Enn. VI, 8, 18, 18][8].

Spirito e Anima conchiude Beierwaltes sono nella luce dell'Uno «luce da luce» (fo's ek foto's) [Enn. IV, 3, 17, 135][9].

Seguendo Plotino, Beierwaltes, sottolinea che «la sfera che deriva dall'Uno e' infinita, non tanto perche' la sua grandezza non puo' essere attraversata e il suo numero non puo' essere misurato, ma lo e', piuttosto, in virtu' dell'incontenibile potenza dell'Uno». [Enn. VI, 9, 6, 11][10].

L'Uno infatti, in quanto attuale possesso' di tutto, e' il piu' potente di tutti enti, ed e' tale essendo il principio «sovraesistente» dell'essere degli enti. [Enn. V, 4, 1, 25][11].

La potenza del Principio e'anche «l'unica vita»[12] che tiene e conserva la sfera intelligibile, conclude Beierwaltes.

«La sfera stessa e' incastrata in seno a quest'unica vita» [Enn. VI, 5, 9, 10s] e tutto in lei e'unificato in quest'unica vita, conclude Platone, anticipando cio' che piu' tardi Ponfirio lo dira' in un altro modo.

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[8] *Idem.*, pp. 1307-1309.

[9] *Idem.*, p. 587 «Tutte le anime illuminano il cielo e gli offrono, per cosi dire, la loro parte maggiore e primaria, mentre il resto del mondo e' rischiarato dagli ultimi raggi. Alcune discendono ancora piu' in basso per illuminare di piu' le regioni inferiori, ma non e' il meglio per loro che procedano cosi. Esiste certamente un centro e intorno ad esso un cerchio che ne deriva irraggiando, e intorno a questo un altro cerchio: luce da luce. Oltre questi, il nuovo cerchio non e' piu' un cerchio di luce perche' manca di luce propria, percio' ha bisogno di luce estranea: esso e' piuttosto come una ruota o meglio come una sfera che dal terzo posto riceva – perche' gli e' contigua – tutta la luce che da esso emana.» Il testo e' molto rilevante anche per quello che Harnack denomina «l'elenizzazione del cristianesimo» con luce da Luce del Credo cristiano.

[10] Plotino, *op. cit.*, p. 1349.

[11] *Idem.*, p. 857

[12] Beierwaltes, *op. cit.*, p. 229.

«I molteplici centri degli intelligibili (noeta') formano con l'unico centro un solo principio». [Enn. VI, 5, 5, 17ss][13].

L'apparizione del concetto di sfera intelligibile e'legato in modo organico dal orisonte in quale Plotino sviluppa la dottrina delle tre ipostasi, l'Uno assoluto, il Noùs e l'Anima e specialmente in un orisonte esegetico della filosofia platonica nel commentario al «Parmenide» di Platone. Pierre Hadot, scrive Giovanni Reale[14], attribuisce questo commentario a Porfirio: il contenuto filosofico e' estremamente denso e significativo, perche' l'autore, interpretando le prime due ipotesi di Parmenide platonico, identifica in ultima analisi l'Uno (il Principio, nella tradizione platonica) e l'Essere (il Principio, nella tradizione aristotelica): in questo modo Porfirio diviene forse l'unico filosofo greco in cui i due grandi paradigmi della metafisica classica, l'enologia e l'ontologia, vengono a coincidere.

«Fino a pochi anni fa, sottolinea Giuseppe Girgenti, si conosceva solo l'esistenza di un commentario di Porfirio a questo dialogo[15], ora, in un palinsesto torinese (andato distrutto all'inizio del secolo) erano contenuti sei lunghi frammenti di un commentario neoplatonico al Parmenide[16] pubblicati fortunatamente nel 1892. P. Hadot[17] ha recentemente rivendicato la paternita' porfirina dei frammenti contenuti in questo palinsesto torinese, confrontandone la dottrina con quella dei brani neoplatonici delle opere teologiche di Mario Vittorino: ha cosi dimostrato che Ponfirio e'la fonte dei brani neoplatonici di Vittorino e che la dottrina e' identica a quella del commentario al Parmenide pervenuto anonimo»[18].

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[13] Plotino, *op. cit.* p. 1165.

[14] Pierre Hadot, *Porphyre et Victorinus*, in Etudes Augustiniennes, vol. II, 1968, (trad.it. Porfirio Commentario al «Parmenide» di Platone, Presentazione di Giovanni Reale), pp. 9-15.

[15] Giuseppe Girgenti, *Il pensiero forte di Porfirio,* Vita e Pensiero, Milano, 1996, p. 235.

[16] Damascius attesta che Porfirio ha scritto un commentario al Parmenide, fr. De rincipiis, 8, 238, t. II, p. 112, 14, ed., Ruelle, *op. cit*., p. 165.

[17] Pierre Hadot, Porfirio e Vittorino, (tit. fr. Porphyre et Victorinus, Paris, 1968), pres. Di G. Reale, tr. di G. Girgenti, Milano, 1993. I frammenti del commentario sono pubblicati a parte: P. Hadot, Porfirio, Commentario al Parmenide di Platone, presentazione di G. Reale, traduzione e bibliografia di G. Girgenti, Milano, 1993.

[18] Giuseppe Girgenti, *op. cit.*, pp. 165-166.

La prima ipostasi (l'Uno puramente Uno) viene definita come Essere anteriore all'Ente, come puro Agire e come Idea dell'Ente; invece la seconda ipostasi (l'Uno che e', o intelligenza) viene definita come Ente che partecipa dell'Essere, come prima Forma e come Intelligenza che pensa se stessa in un movimento di processione e di conversione. Questa dottrina porfirina, rielaborata da Mario Vittorino e Agostino, e' importantissima anche per comprendere come i materiali della filosofia greca siano stati utilizzati dai Padri per una prima formulazione teologica del dogma della Trinita'i Principi descritti da Porfirio verranno infatti identificati come le persone della Trinita'.

«Infatti Essere ed Ente corrispondono alle due prime ipostasi (l'Uno e l'Intelligenza); ma in Porfirio c'e' di piu', nota Giuseppe Gingenti[19]: lo stesso Uno e' gia in se' medesimo una sorta di Intelligenza assoluta, senza distinzione tra conoscente, conosciuto, conoscibile e conoscenza. Questo vuol dire che l'Intelligenza e' gia nell'Uno, e che la generazione e' solo una manifestazione all'esterno di qualcosa che già era all'interno. Pertanto l'Uno-Dio e' Figlio e Padre di se medesimo, come abbiamo già visto».

Seguendo G.Girgenti quando parla dell'Intelligenza divina in quiete e in movimento,questo afferma che «Porfirio quando presenta la sua dottrina dell'Intelligenza prosegue la sua analisi del dialogo platonico; la dottrina dell'Intelligenza, in questo come in altre opere porfirione, e' legata a quella della «vita», cioe' al momento della processione della seconda ipostasi. «Vivere» e «pensare» costruiscono l'attivita' pura e semplice dell'Uno-Essere, il quale, nel momento (naturalmente atemporale ed eterno) in cui non si accontenta di «pensare», ma vuole «pensare-qualcosa», e cioe' in primo luogo se medesimo, esce allora da se', in una processione che diviene «vita infinita» (aoristos kata' ten zoe'n), cioe'movimento al di fuori, per poi riconvertirsi nella Forma della Intelligenza dell'Uno-Ente. Allora Uno-Essere e Uno-Ente, le prime due ipostasi ricalcate sulle prime due ipotesi del Parmenide, si possono e si devono considerare come due stati dell'intelligenza divina, la prima in quiete, la seconda in movimento, cioe' nell'atto di uscita da se' e di ritorno in se' per autocontemplarsi. In primo luogo Ponfirio parla dell' Intelligenza in cui intelligibile e intelligente coincidono in quiete assoluta, definita l'Intelligenza che non può rientrare in se' (o'nous me' dunamenos eiseltein eis eauton); ritornano i termini teologici negativi, essendo questo Uno-Semplice-Intelligenza indicibile e inconcepibile (arreton kai anennoeton); ma imediatamente Porfirio applica a questo Uno incoordinato la coordinazione con la Triade esistenza, vita, pensiero, secondo il passaggio ormai noto dalla teologia negativa a quella afferamativa, e secondo il capovolgimento di prospettiva che abbiamo analizzato»[20]

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[19] *Idem.*, p. 236.

Il punto più importante in cui Porfirio si distacca da Plotino e' sottolineato da Girgenti così: «... per Porfirio, l'essere al di sopra (e'pe'keina), non comporta il non-essere cio', che segue, ma il contenere in modo semplice e universale cio' che segue. «Essere al di sopra dell'ente, della vita e del pensiero», non significa «non essere, non vivere, non pensare», bensi «essere, vivere e pensare» in modo assolutamente semplice»[21].

«Potremmo formulare un primo schema che rende conto degli atti dell'intelligenza divina, conchiude Girgenti, second i testi ponfiriani, nel modo seguente:

Intelligenza divina in quiete = identita intelligenza = intelligibile.
Intelligenza divina in movimento
- all'esterno = alterita'intelligenza – intelligibile
- all'interno = atti di pensiero vero e proprio

D'altro canto, i tre atti corrispondono rispettivamente alla manenza (= quiete), alla processione (movimento al di fuori di se') e alla conversione (movimento che torna in se'). E' anche chiaro l'intento di unire la concezione neoplatonica dell'Uno e dell'Intelligenza, con quella aristotelica di Dio come «pensiero di pensiero»; resta pur da chiarire lo statuto dell'Intelligenza demiurgica»[22].

Abbiamo visto le due ipotesi trattate da G.Gingenti. Per la terza ipotesi del Parmenide prendiamo in esame il commento molto accurato di Mateo Andolfo[23], che nella sua intenzione e' di dimostrare che la concezione plotiniana del «movimento» dell'Anima e del rapporto, in essa, fra eternita'e tempo non e' altro che il frutto dell' «esegesi» della terza ipotesi del «Parmenide»:

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[20] *Idem.*, pp. 235-236.

[21] *Idem.*, p. 239.

[22] *Idem.*, p. 242.

[23] Matteo Andolfo, *L'ipostasi della «Psyche», in Plotino*, Vita e Pensiero, Largo A. Gemelli, 1, Milano, 1996.

Se, infatti, si ritorna ad esaminare VI, 1, 16, 31 AS.,si scorge, a nostro parere, un riferimento a Parmenide 156c 8-E 7, che e' proprio la sezione della terza ipotesi in cui Platone tratta dell'istante:

«156c 8-D 1: Allora, quanto muta? Non muta infatti ne' mente e' quiete ne' mentre si muove ne' mentre e' nel tempo»[24]

VI, 1, 16, 33-34, «Anche I mutamenti avvengono nell'atemporale»[25]

«156D 6-E 7: L'istante, questa natura atipica, si situa a mezzo tra il movimento e la quiete, non essendo in alcun tempo, mentre verso esso e da esso cio' che si muore passa all'essere in quiete e cio' che e' in quiete passa al muoversi… E l'Uno, dato che e' in quiete e si muove, muta, passando da uno stato all'altro, e viceversa, […] mutando nell'istante, sicche' quando muta non e' in alcun tempo»[26].

E in Plotino:

«VI, 1, 16, 32-33: Niente impedisce che anche il movimento abbia inizio nell'atemporale e che il tempo si generi con la distensione»[27].

«Se, alla luce di tali innegabili tangenze tra I due filosofi, riconsideriamo la dottrina plotiniana del «movimento» dell'Anima sopra esposta, riteniamo commento Matteo Andolfo, sia possibile interpretare il passaggio vicendevole tra le due comportamenti del «movimento» psichico come mutamento dalla quiete al movimento e viceversa[28], poiche' l'ephesis ascensiva e' movimento-immobile (analogicamente al movimento globale della seconda ipostasi), in quanto comporta un «decrescere» progressivo dell'Alterita' (in cui ispessirsi, invece, determina la distensione temporale della dianoia psichica), mentre il «movimento verso il basso» conduce l'Anima a temporalizzarsi»[29].

«In sintesi, ci dice Andolfo, Plotino, mutando il referente dell'Uno – della – terza – ipotesi, ha reinterpretato l'istante platonico, trasformandolo da stato atemporale, intermedio tra due stati divenienti e temporali, in «parte» essenziale dell'Anima, che si trova nell'atemporalità', ma che, in quanto attuantesi come noesis, si trova a mezzo tra il movimento-immobile (in quanto ascensivo ed astrattivo) dell'ephesis psichica e il movimento disteso (e perciò temporale) della dianoia psichica. Riesprimendo tutto questo un'ultima volta, possiamo dire che Plotino trasforma i tre stati dell'ipotesi di Parmenide in tre aspetti metafisici dell'essenza dell'Anima, poiche' la quiete corrisponde all'Uno – immanente – all'Anima, condizione del suo anelito ascensivo all'Origine, il movimento corrisponde alla dianoia e l'istante al noùs dell'Anima, intermedio tra l'Uno – in – Lei ed il dianoetikon»[30].

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[24] Platone *Parmenide*, Editori Laterza, Torino, 1998, p. 79.

[25] Plotino *Enneadi*, Rusconi, Milano, 1994, p. 989.

[26] Platone, *Parmenide*, Editori Laterza, Torino, 1998, p. 79.

[27] Plotino, *Enneadi*, Rusconi, Milano, 1994, p. 989.

[28] Infatti, la nozione di passaggio commenta Andolfo e' il «nucleo» del concetto platonico di mutamento nel «Parmenide».

[29] Matteo Andolfo, *op. cit.*, p. 306.

«In conclusion, Plotino, come dice Andolfo[31], si e' servitor di una dottrina, quella del noùs dell'Anima che egli ha tratto dall'esegesi della Repubblica e del Timeo di Platone, costituendola come chiave di volta per interpretare la terza ipotesi del Parmenide. L'Uno di tale ipotesi rappresenta la terza ipotesi e si presenta nel dialogo con caratteri apparentemente contraddittori: è in quiete ed in moto, è uno e molti, muta e passa da uno stato all'altro, è nel tempo; contemporaneamente e' condizione del proprio mutare e, come tale, non può essere nel tempo ne' può mutare quando e' in quiete o quando e' in moto, ma deve situarsi in uno stato atemporale, quale e' l'istante».

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Ferdinand Gonseth About Dialogue – Meanings And Interpretations[1]

Ionuț ISAC

ABSTRACT: Reflections about dialogue are an important part of the Swiss thinker Ferdinand Gonseth's anthropology and they are intimately connected to his epistemology. The general framework of the dialogue is that of a dialectical interplay *identity-otherness*. Thus, only the beings in dialogue who consider each other as *alter ego* can get to the truth as objective and subjective synthesis. The laws of dialogue that Gonseth establishes are meant to settle guidelines and norms in order to attain this goal: 1. the seriousness of personal and reciprocal engagement; 2. sincerity; 3. a kind of "intolerance" towards the purpose of genuineness of the dialogue; 4. openness to experience. These principles attain their highest degree inside of the researchers' community through *the consciousness of the dialogue*. How can one understand this idea? This paper attempts to explore some of its meanings and interpretations, accounting for Gonseth's original point of view that each *schemata* and meaning of the language opens itself to the experience: a. from the side of the objects and signs; b. from the side of the subject. This way, the human persons are 'making themselves' through the dialogue, experiencing what they share with others and the testimonies that they reciprocally owe.

KEYWORDS: *Ferdinand Gonseth, communication, research, dialogue, dialectics*

The Swiss scientist and philosopher Ferdinand Gonseth (1890-1975) developed a philosophy of knowledge that he called "*idonéisme*". The word

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comes from Latin *idoneus* (appropriate, suitable, sufficient). One of his best students and fellows (François Bonsack) explains and translates Gonseth's fundamental concepts and the core of his view this way: "The French word *idoine* can be translated in English by *adequate* and the quality *idoneité* by *fitness* or *adequacy*. It is near to what van Fraassen calls *empirical adequacy*[2]".

According to Gonseth's approach, the epistemological examination of our knowledge leads us to the conclusion that it is not possible to achieve knowledge of the so-called "ultimate" metaphysical truths, that would be able to give us access to a "reality-in-itself". On the contrary, he criticizes what he calls the two fundamental errors and persistent illusions of the human mind over time: the world of the "truth-in-itself" and the world of the "reality-in-itself". In order to make it easily understandable, Gonseth defines adequacy in the following way: "Adequacy is the quality of the statement which, in a given situation, fits the circumstances, conditions, demands and means of investigation of the best situation[3]". The extent to which knowledge is *adequate* depends on what it is capable of denominating (something real), in a certain moment. There is no definitive and absolute truth of knowledge, for the simple reason that such a truth would violate the principle of connecting what we know with what we experience, and that might, sometimes, contradict the knowledge we have already got. Adequate knowledge does not nurture the ambition to be the truth at any price (i.e. a classical-metaphysical one, disconnected from experience), but, on the contrary, to maintain access to controllable experience.

Therefore, adequacy is an intellectual stance that values the idea of *openness to experience* for the whole of our knowledge (including the philosophical one), with the consequence of denouncing immutable foundationnalism in favor of a flexible strategy opened to experience, organized and explained by a specific methodology.

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[2] For the semantic explanation of Gonseth's vocabulary and more details from the point of view of comparing adequacy with pragmatic justification, see François Bonsack, "Pragmatic Justification and F. Gonseth's Idoneism", accessed January 3, 2012, http://sammelpunkt.philo.at:8080/1512/1/bonsack.pdf, pp. 50-51.

[3] François Bonsack, "Pragmatic Justification", p. 51: "For Gonseth, all knowledge is summary, approximate, schematic, revisable, open to future modifications. It is not true, it is only adequate".

The more Gonseth explains and develops his view, the more the dialogue increases its importance inside of his epistemology and anthropology. Thus, the person engaged in dialogue becomes the explorer of two interconnected ways of communication: the first one is that of *self-identity*, where "the subject is his own witness of what he is as a subject"; the second one is that of *otherness*, through which the subject of the dialogue shows himself to other(s) as a witness of his existential status. This kind of existential "testimony" needs to be specifically validated by other people and, generally, by the world (the social *milieu*) in which we are living. Assuming the crucial presupposition that "the other one" is similar to me with regard to his/her subjectivity, makes it possible to be recognized as my *alter ego* and opens the way of dialogue in search for the truth[4]. Only this second way validates and justifies the first one, but both are pre-conditions of the dialogue. One can say that, thus, through the dialogue humans are becoming or "making themselves", valuing each other as witnesses of their own beings in both of their subjectivity and objectivity.

In order to find in other persons the phenomena of consciousness, one has to raise the condition of others to the level of witnessing for oneself; this is how one can overtake and expand the horizon of identity to its enrichment by and with the horizon of otherness[5]. This happens when the partners in dialogue involve themselves in a common "procedure of testing and witnessing ('une procédure d'épreuve et de témoignage')", leading to a dialect of sacrifice.

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[4] See, for instance, Ferdinand Gonseth's study "Homo phenomenologicus", in his *Science, morale et foi*, L'Âge d'Homme, Lausanne, 1986, p. 50: "Il existe donc un certain ensemble d'états d'âme de la personne, ou, si l'on préfère, de façons d'être au monde du sujet en tant que sujet, dont celui-ci peut prendre conscience sans intermédiaire, dans une complète intimité avec lui-même". […] Indissociables en regard de cette cohérence [meaning the feeling and the idea that the person has got of him/ herself – I.I.], elles signalent [the modalities of self-awareness – I.I.] l'une et l'autre la voie nécessaire de l'*altérité*. Car seule l'altérité offre à la personne le moyen d'insérer sa propre valeur de témoignage dans 'une procédure d'épreuve et de témoignage' à laquelle les autres et le monde participent".

[5] See Edmond Bertholet, *La philosophie des sciences de F. Gonseth*, L'Âge d'Homme, Lausanne, 1968, p. 86, where the result of this shift is described as follows: "… la discontinuité et la malléabilité du langage et des horizons, la nécessité que l'un de ces horizons disparaisse ou se modifie pour qu'apparaissent les traces d'un autre, en un mot l'expérience de l'imprévisible et de l' 'ouverture du sens'".

The interlocutors become reciprocally (one to another) horizons of reality *sui generis*, through which it occurs the experience of the unforeseeable, the "openness of the sense" (E. Bertholet). Each and every locutor becomes a linguistical and experiential horizon for others, symbollically marking the discontinuity and flexibility of the (ir) speech/ communication by his/ her specific signs of openness (i.e. a new linguistical and experiential horizon). In Gonseth's view, the dialogue is more a prescription than a privileged kind of language, and it is by this prescription that the language becomes a "speech act" ("*acte de langage*"). It re-shapes and re-considers the meaning of speaking, it re-interprets ideas, models and values; nonetheless, it gives birth and perpetuates the communication and the exchange of information at the within the communitarian interactions.

The idea of "horizon of reality" originates in F. Gonseth's epistemology and philosophy of science, where it designates the grand historical results of scientific knowledge in the exploration of the depths of the existence, as seen both simultaneously and successively. This "thoroughgoing" ("*approfondissement*")[6] that, for instance, modern physics does theoretically and experimentally, is objectivized by two horizons of reality: one is the so-called horizon "A" (superficial) – in fact, a theoretical refinement of the natural horizon of (macro)-reality; the other is the horizon named "P" (profound), belonging to micro-reality (quanta), which leaves "signs" or "marks" in the first one[7].

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[6] Edmond Bertholet, *La philosophie des sciences*, p. 248: "L'idée d'approfondissements successifs ne peut être traduite que par une métaphore susceptible de relativiser et l'idée d'approfondissement (en lui incorporant celles de palier et de limite) et l'idée de succession qui ne doit pas exclure la simultanéité et la juxtaposition. La dialectique gonsethienne se sert du mot *horizon*, dont le premier avantage est de pouvoir s'appliquer à l'abstrait, sans cesser d'appartenir au concret de l'information naturelle".

[7] François Bonsack, "Pragmatic Justification", p. 51: "During the inquiry, it may happen that a model that appeared until now perfectly adequate appears insufficient in other circumstances. What Gonseth calls a horizon of reality must make room for a deeper horizon".

When the physicist researcher inquires into the reality using the experimental devices put at work, he/ she initiate a dialogue with the inanimate, compelling it to “speak” in terms of collected data. As a way of interpreting them, N. Bohr’s principle of complementarity reveals the relationship between the phenomenological manifestations of the physical processes belonging to the horizon P. The language that scientists use to describe quantum phenomena attempts to account for “the essential paradox of wave-particle dualism”, where “The obvious logical problem is how a particular something localized in space and time, the particle, can also be the spread-out and the continuous something, the wave[8]”. The “dialogue” between the two horizons of reality takes place at a giant scale and becomes comprehensible only when mediated by the measuring apparatus, the existence of an observer, and of course, the scientific language[9]. Eventually, it always pushes human knowledge further.

From this point of view, the evolution of knowledge consists of shifting from a horizon of reality to another, with no possibility of considering some of them as being the “last” one. The knowledge that once had been validated inside the frames of a certain horizon remains valid at that level but is subjected to revision at the level of an “evolved” horizon (which is the case of Newtonian physics related to the paradigm of quantum mechanics). Skepticism and radical epistemological relativism are, thus, avoided; however, what is considered today to be epistemologically valid in terms of knowledge would not tomorrow become a deserted field[10].

In Gonseth’s view, the language reveals itself as a schematizing process of meaning/ significance; it connects the subject to the object(s), the world of identity with the world of otherness. He advances an original point of view, saying that each *schemata* and meaning of the language opens itself to the experience, both from the side of the objects and signs and from the side of the subject. Similar to the dialogue of a person with another, a secret dialogue between the personality as a whole and its near environment can be achieved.

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[8] See Menas Kafatos and Robert Nadeau, *The Conscious Universe. Parts and Wholes in Physical Reality,* Springer Verlag, New York, 2000, p. 33.

[9] Kafatos and Nadeau, *The Conscious Universe*, p. 34: “What has consistently troubled physicists about this situation is that it implies that we can no longer see the preexistent truths of physical reality through the lenses of physical theory in the classical sense”.

[10] See Ionuţ Isac, “Quelques considérations sur le concept d’ ‘horizons de réalité’ chez Ferdinand Gonseth”, *NOESIS* XXX-XXXI, 2005-2006, pp. 139-48.

In the spirit of its epistemological and anthropological view, Gonseth brings arguments sustaining a "*law of the dialogue*", whose necessity results from all the elements that those communicating experience, namely from their conviction that they mutually share sincerity, good faith and a genuine desire to get closer to the truth. The truth is not already given for everybody who wants to seize it without effort and then to use it for fulfilling any possible claim; nor can one speak about a truth scattered in "pieces", inviting us to grab anyone of them we like for the purpose of serving our interests[11]. He asks himself rhetorically what kind of dialogue would be one in which nobody wants to convince (the others), passing away and allowing them to keep their truth unbothered? Those who pretend not to do such thing are, in fact, only shamming. The scope of the dialogue has to be *the accuracy of ideas*, much more than for the ideas themselves, as they can be fallacious, elusive or just speculative, deaf to the voice of experience. The worlds whose inhabitants are aware of that scope, and thus, make efforts for progress, is the only one worth striving for. So, the dialogue aims to the highest possible level: i.e. *to think correctly, adequately*, as its meaning does not become obvious until one carefully analyses the problem of *thinking's correctness*.

As it results from Gonseth's philosophy of adequacy, the dialogue as a process contained in 3 major stages:

1. There is an initial standpoint, where each person who has something to discuss/ debate comes with his/ her own point (of view), obviously different from the others. The dialogue begins only when people cannot

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[11] See Ferdinand Gonseth, "La loi du dialogue", *Intervalles* 27, Juin 1990, pp. 49-50: "'A chacun sa vérité', c'est une profonde vérité pour un monde d'aliénés. Je ne veux pas que ce soit ma vérité. Si pauvre et misérable que soit le monde des hommes, il vaut mieux qu'une aussi pauvre et misérable vérité. Je ne crois certes pas à une vérité toute faite qui devrait être uniformément et exhaustivement la même pour tous. Mais je ne crois pas non plus à une vérité sans corps qui n'aurait que des facettes, à une vérité sans lien qui n'aurait que des parties, à une vérité somme de tout le possible, dans laquelle toutes les oppositions seraient d'avance réconciliées, à la constitution de laquelle toutes les singularités, toutes les anomalies et toutes les absurdités seraient nécessaires".

reach a mutual understanding of their thoughts. This is the most "natural" and desirable situation, because if those interested in dialogue came with the same point (of view), their meeting would be useless; the same if they would reach easily and artificially a common conclusion, without debating their opinions indeed[12]. However, all of those sitting at the table of discussion have to agree with the principle of authentic research for the truth, in the spirit of the openness to experience.

2. An intermediate stage or level, characterized by an individual and collective valuing of each and everyone's *resistance* to the other's position (in terms of denials, counter-arguments, deconstructive strategies and so on, attentively considered once they have been formulated), in terms of grasping a potential agreement able to overtake both points of view and integrate them reciprocally. Here one can speak about a "waiting-for state", where each dialogical consciousness has to tend towards what it is not yet, but may become, as a part of what Gonseth calls "*The Dialogue's Consciousness*".
3. A final stage or level, with and through which those who have participated in the dialogue, succeed in enriching and correcting their thinking, moving it closer to the truth than it was before the dialogue began.

Gonseth establishes 4 laws of the dialogue, meant to settle some as many as norms in order to attain the aim of getting nearer to the truth:

- *The seriousness of personal and reciprocal engagement*. No one can hope to achieve clearer thinking and make real steps toward the truth unless he/ she fully engages with the process of communication. Doing otherwise is like gambling with one's own mind, without any serious chance of succeeding to do the right thing.
- *Sincerity*. When communicating with other(s), one has to be completely sincere. If not, somebody would deliberately search for solutions

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[12] Ferdinand Gonseth, "La loi", 51: "Mais le dialogue commence véritablement par la rencontre de l'autre pour celui qui distingue derrière l'affrontement des positions adverses *les problème de la justesse de sa propre pensée autant que de celle des autres* […] Il faut partir de ce qui est, du fait même qu'on ne s'entend pas. Il faut faire servir le désaccord à la progression des uns et des autres vers une pensée plus juste. Nous disons bien vers *une pensée plus juste* et non pas seulement vers une tolérance universelle plus ou moins éclairée". (Our italics).

through manipulation or even by casting lots, instead of bringing arguments and honestly trying to convince other people about what one says.

- *A kind of genuine intolerance on the purpose of genuineness of the dialogue*. This is by far the most controversial demand that Gonseth's plea contains. What he understands by being intolerant is not a way of imposing one's ideas on others, by disregarding their opinions – which is the easiest and the worst thing to do – but simply to not allow a sterile contradiction between those participating in the dialogue, as that would hinder them from grasping the fruitful path to the truth. On the contrary, being intolerant is a stance of keeping in with the spirit of the dialogue (i.e. that of being a method of work, a kind of research and not just a talk). So, one has to make the difference between *systematical intolerance* (which is theoretically and methodologically possible and desirable) against everything that can compromise the dialogue and *practical tolerance* with respect for those engaged,[13] whose moderator is
- *The openness to experience* (i.e. the experience of the dialogue), which makes sense for those who accept fear from error. Such a kind of openness mitigates the systematical intolerance's fervor, bringing every time a fresh view consisting of other's points or comments. Each and every participant at the dialogue has to continue it responsibly, accounting for the purpose of the common research. Also, when speaking, especially about the dialogue between researchers, the rule of *informational incompleteness* is a must guide for the researcher's professional behavior, as nobody could ever get the "complete" knowledge (not even that of his/ her own field of specialization)[14]. The openness to the information coming from others

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[13] Ferdinand Gonseth has had serious polemics on this subject-matter, with Rolin Wavre among others. See, for instance, F. Gonseth, "La loi", 53, where he wrote that "Je lui repondis [to Wavre – I.I.] que l'intolérance dont il s'agit ici ne vise pas les personnes, qu'elle ne se rapporte qu'au dialogue, pour autant que celui-ci doit être envisagé comme une méthode de travail, comme une forme de recherche… Pour que le dialogue, en tant qu'expérience collective, puisse briser et surmonter les contradictions dont il part, il faut que l'intensité en reste soutenue par une véritable intolérance mutuelle, non pas par une intolérance aveugle et chargé d'affectivité, mais par une *intolérance méthodique*". (Our italics).

[14] See Ferdinand Gonseth, *Le référentiel, univers obligé de médiatisation*, L'Âge d'Homme, Lausanne, 1975, pp. 88-90.

(researchers, ideas, fields etc.) is a crucial condition for the success of a dialogue. In this respect, the academic community of researchers in dialogue remains for F. Gonseth the ideal model of communication for all those who congregate, for both integration through informational exchange and its methodology, ruled by engagement, openness and incompleteness[15].

Nevertheless, the truth is authenticity's proof and remains the object of a search aware of the fact that reality, being, existence are much too vast and rich to be understood at the first attempt without wandering. Since nobody can ever possess *the* truth (i.e. the mythical "absolute and final" truth, given once and for all to everybody), only the dialogical form of spiritual activity makes sense for the word "truth", in order to assign it both a concrete objective and subjective (including pragmatic) efficiency: "As Gonseth says, we have to take decisions in a state of informational incompleteness, which means that we will sometimes be mistaken. But that does not prevent our knowledge to be, in many domains, extremely efficient. Knowledge doesn't need to be absolute and definitive to be efficient: even summary or partial knowledge can be already useful… Unfortunately, our knowledge is fallible, and we have today no means to distinguish between definitively established truths – supposing that there are some – and those that will be questioned tomorrow… It's wiser to admit that there is, hidden in the knowledge that we believe true, part of it that will possibly someday appear false[16]". Thus, Bonsack stresses Gonseth's point on the limits of knowledge, with the edge on one of the two false epistemological dogmas (i.e. that of the "truth in itself" or the "absolute truth").

Contrary to certain philosophical traditions, from his point of view, Gonseth bans philosophical isolation. One cannot find the great existential truths neither by just getting deeper into one's own being nor by doing the opposite – launching oneself blindly into the world's excitement. The philosopher's loneliness is not a good recipe for those who really want to get closer to the truth, as he/ she cannot communicate with others and become vulnerable to some great inner dangers. Were this aspect true (i.e. the loneliness as a privileged path to the truth), the history of human thinking would not have been full of errors of all kinds[17].

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[15] Vasile Tonoiu, *Idoneismul – filosofie a deschiderii*, Editura Politică, Bucureşti, 1972, p. 56.

[16] François Bonsack, "Pragmatic Justification", p. 51.

What Gonseth was looking for is a certain kind of reasonable agreement (ideally conceived) between different and divergent philosophical positions. Instead of proclaiming a certain philosophical belief as absolutely true and trying to impose it on all other philosophers, it is more sensible to invite them to the dialogue. If one attempts to find the absolute truth or the reality in itself alone, then this is the alienation symptom, as nobody could ever attain such an aim[18]. But those who are committed to philosophical dialogue (or just to dialogue *tout court*) can receive valuable help from science. A mathematician of high level, Gonseth recommends his favorite science to philosophers, such as a successful model of dialogical practice, in the narrowest and straightest sense. In a broader sense, science *lato sensu* (not just mathematics) is recommended to play this role, and it is supposed to get these jobs well done through proper "casting" (i.e. with professional researchers as "actors").

The human person is structured on the purpose of experiencing the self-discovery and self-realization, interconnected with the discovery and realization of the world. The subjectivity, writes Gonseth, is predisposed to the "openness to experience", and not to the "openness to freedom" (in the unclear meaning of an "absolute freedom"). Once they involve themselves in dialogue and consent to its main rules, that the human persons are "making themselves", becoming by reconstructing the common framework of experience and knowledge. If they failed to succeed their participation in the "dialogues' consciousness", then the inferno of nonsense would wait for them around the corner. The consciousness has to remain open to the proof of experience, of revisability, in order to understand and accept the idea of unity in difference of the objective and subjective, the rejection of dogmatic mentality and alleged apodictical certainties.

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[17] Ferdinand Gonseth, "La loi", p. 55: "Mais suffit-il de penser dans un silence vigilant, dans un recueillement attentif et tendu, pour penser juste? La méditation solitaire et prolongée est-elle une garantie sûre de la vérité des édifices mentaux qu'elle distingue et qu'elle élève? S'il suffisait, pour qu'une idée soit juste, qu'elle ait été longuement et patiemment mûrie au sein d'une conscience d'homme, pourquoi toute démarche efficace de la pensée devrait-elle être payée de tant d'erreurs? En réalité, tout esprit qui s'isole s'expose. En refusant de se mesurer aux suggestions qui lui viendraient de l'extérieur, il se livre à certains périls qui lui viennent de lui-même".

[18] Ferdinand Gonseth, "La loi", p. 55: "L'homme (j'en ai l'intime sentiment) n'est pas un être clair, un être de lumière qui sache marcher, seul et sans appui, vers ses propres vérités. S'il les cherche dans ses propres profondeurs, en oubliant (en voulant oublier) qu'il est partie d'un monde qui n'est pas tout en lui, ce qu'il y trouve est en plus un amalgame de passion, de sève et de vérité que la trame d'une connaissance essentielle et universelle".

A criticism brought by V. Tonoiu to Gonseth's view on dialogue, to which we subscribe without major differences, largely focuses on the idea that philosophy coordinates and integrates human interactions through communication not just in the epistemic field (which is governed by cognitive values), but also in the fields of moral values and practical life. On one hand, the ideals of rightness, objectivity and efficaciousness cannot have the complete command on a philosophical endeavor. On the other, the experience or the fields of human engagement cannot be fully presumed as homogeneous. Philosophy is a creation *sui generis*, whose value is contained in a considerable amount within the limits of its spiritual substance (as work done), not entirely being subjected to an adequate and coherent integration in and through some kind of external experience[19].

Approaching the problems of dialogue, Gonseth proffered his philosophy of adequacy, whose fundamental law is that of keeping the openness to experience – not, however, on the base of ideological reasons (like Marxism) – but by being ready to revise its propositions when, and as much as needed, in order to remain itself faithful.

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[19] Vasile Tonoiu, *Idoneismul filosofie a deschiderii*, Editura Politică, București, 1972, p. 51.

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Economical Theories and Practice

A Critical Comparison of Public vs Private Leadership[1]

Liviu GAVRILESCU

ABSTRACT: Leadership is an extremely complex phenomenon, which envisages a wide range of issues from decision making to inter-personal relationships. This relative recently studied phenomenon is considered one of the most important elements of success of an organization. This paper aims to examine the two forms of leadership existing in private organizations belonging to businesses and, respectively, in Romanian public administration. In addition, we try to highlight their points of convergence and divergence. With the second major financial crisis of recent years on the horizon in the world, the responsibility of various governments in managing public funds and substantial reform of the state is more and more questioned. We believe that this paper makes a modest contribution in clarifying models of responsible and effective management of public institutions.

KEYWORDS: *leadership, public/private organization, management, success, reform*

Some considerations on leadership

The success of an organization depends on its leader, but also is its main responsibility. What it means to be a successful leader is practically the definition of leadership and, also, the very extensive study of this concept

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has been given at least the last half century. To be driven, organizations hire managers, with the main task of achieving the goals set under certain conditions and restrictions, especially regarding time and money. Why a manager (director, manager, administrator, etc.) should become a leader and what a manager needs to do for this are legitimate and essential questions.

Leadership is an attribute desired and required by the organizations to their managers and is directly related to the ability to influence people's behavior. The talent to lead determines the efficiency threshold of a person. Management activities involve the accomplishment of tasks by organizing the efforts of others, rather than an action taken by one person.

Some experts in the field believe that "manager" and "leader" are synonymous terms and should be used alternately. Others consider the concept of leadership so important that the word management should be abandoned. However, leadership and management are in fact different dimensions of people "in command": leadership is that process in which one person sets the purpose or direction for one or more other persons, and gets them to move along with him or her and with each other in that direction with competence and full commitment[2].

The manager, however, is the individual who assures the achievement of the organizational goals through planning, organization and orientation of work towards an end. Therefore, a person can be an effective manager without a capacity in leadership.

Management is more about efficiency and stability, while in leadership these concepts are of secondary importance. The major importance is given to motivation and leading the people towards the achievement of objectives (effectiveness).

Leadership is a highly controversial concept in its nature and characterrization. Over time, this concept has enjoyed a variety of approaches, according to the structure of interest of the researchers.

Leadership has two meanings: the activity through which people are oriented towards a goal of the company (but not by coercion) and persons who engage in such actions. So, naturally, each of the two dimensions of the concept, in terms of practice, puts a distinct fingeprint on the elements of the organizational culture. As an activity, leadership enters in contact with the rules and principles of the organization, either following their original spirit, either contradicting them partially or totally. This occurs when some individuals exert some influence on others when it comes to achieveing objectives in an organizational context. Efficient leadership exerts influence in order to achieve organizational objectives by increasing productivity, innovation, satisfaction and motivation of workers.

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[2] Elliott Jaques, Stephen D. Clement, Ronnie Lessem, *Executive Leadership: A Practical Guide to Managing Complexity*, Wiley-Blackwell, 1994, p. 4.

There is a whole literature on the differences between managers and leaders. Leaders are visionaries, and managers are those who plan. Leaders pay attention to the substance, managers form and process, leaders do the right thing, managers do things right[3], etc.

Researchers have discovered that successful leaders grant:

- greater importance of certain activities, such as planning or training;
- more confidence to subordinates, being strongly oriented towards people.

Thus if the manager is the one who administrates or maintains the business activity at its normal level, the leader is the one who innovates, develops business activities and thinks ahead.

Private and public organizations

For the purposes of this paper, private organizations refer to business organizations, and public organizations to institutions or authorities of the public administration. In this sense, the main difference is the profit and the market orientation of the first and the absence of such guidelines of the last. Public organizations have as main purpose the serving of the public interest.

Differences between the public and private sector should not be overestimated, but we must still take into account certain specific features and characteristics. It is said that the government is the management applied to the state affairs. Business characteristics are better defined and understood, so we consider there is no need to insist on them. Government environment is however more complex and more sensitive to socio-economic and political trends.

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[3] Warren Bennis, *On Beconing a Leader*, Adison-Wasley Publishing Company, 1984.

In the public sector there are many factors involved:

- Competition does not play the same role and the consequences of choices made by clients are different. However, the "customers" of public services really have a choice: they can choose "not to participate in the public system" (whether in whole or by disrespecting the requirements). The costs of these decisions are also supported by the government, which has the duty to enforce the law.
- Although each person wishes the individual needs to be respected, according to the status of the citizen and taxpayer. Public service for the entire population, providing efficient service at high quality standards is still wanted.
- Unlike the private sector, public sector organizations can not afford to choose or to focus on their preferred customers or on the most advantageous clients: the public sector organizations must take into account the needs of the community. Indeed, for many public services, the "customers" considered important by the government, are those customers who present no interest for most commercial service providers. These people are often extremely difficult to identify.
- In many cases, the goal of public intervention is on long-term and is based on a series of complex factors that interact. Often, success occurs over many years, and traditional cost-benefit analysis used in the commercial sector simply can not be applied in these cases.

These factors combine to build an image which shows that, although the role of the client is different in the public sector, the citizen has the right to be treated as a customer, and the provisions on which the public sector works should be fair for everyone, regardless of the context.

The differences between the public and private sector, from the citizen's point of view, are becoming increasingly limited. Competition in the private sector outlines the characteristics of the future service delivery environment, which will be used as a term of comparison for the public sector.

Towards a new paradigm

If for business, globalization is the main confrontation and factor of change, the public sector's openness to the citizen-customer and the quality of the services provided has become important standards by which the administration is judged.

In the following decade, the management of organizations has to face an extremely severe test, as determined by the large changes in almost all fields: demographic, social, educational, political.

In the early 1990s, a new management model for public institutions was outlined and promoted in developed countries. This brought together some modern concepts and approaches made by the researchers:

- Managerialism (Pollitt, 1993)
- New Public Management (Hood, 1991)
- Market-oriented public administration (Lan, Zhizoung and Rosenbloom, 1992)
- Post-bureaucratic paradigm (Barzelay, 1992)
- Entrepreneurial government (Osborne and Gaebler, 1992).

But beyond the diverse terminology used, the basic principles and laws were the same. New public management is based on the following core values:

- orientation towards the management of the public institutions, not on the general policy pursued by politicians;
- focusing on the evaluation of performances in public institutions and considering the economic efficiency as the final form of its coverage;
- division of the bureaucratic apparatus and the financial management;
- the market orientation of public institutions;
- reduce the costs of the administrative apparatus maintenance and functioning in general, and of the public institutions in particular;
- remodeling the public institutions management style, focusing on the results obtained, observing the deadlines included in the strategies, policies, programs, material motivation and the freedom to manage.

This approach, oriented mostly for the public organization, involves significant changes particularly in the human resources domain. Right from the front page, the 1990 OECD report stated that most developed countries have turned to radical changes when it comes to the cultural values of the public administration, and this process must continue at an accelerated rate.

The last decade, governments of various countries have clearly defined a new imperative for the management of their activity. Here are some of the imperatives[4]:

- a radical change in the "culture" of the public administration must be done, if an improvement in efficiency and effectiveness is wanted;
- the public administration must be much more oriented towards results; productivity is important;
- the improvement of the working conditions, of the way civil servants are led and the strengthening of the civil service awareness are significant factors leading to improved services;
- there was a desire to change the simple conformation with detailed regulations and the obedient management with the independence and initiative of the operational managers;
- managers should be held responsible for what they do and the results they obtain;
- human resource management must be approached in a strategic and integrated manner which must recognize that people are the basic resource of creating a productive and efficient public service;
- the transfer of the decisional power to lower levels is considered an important factor;
- staff development and training have given another status to public officials in many countries;
- policies have been developed that provide equal employment opportunities;
- many countries are put in a position to monitor and evaluate achievements, and pressures in this direction are becoming larger.

Governments should more promptly respond to the needs and demands of the society. Public sector organizations are reorganized in order to provide better, faster and more numerous services. The citizen /customer occupy a key position in these reforms.

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[4] Value and Vision, Management Development in a Climate of Civil Service Change, *Public Management Occasional Papers*, OECD, Paris, 1993, p. 6.

For many years, customer satisfaction issues were on the EU agenda, and recently these issues have gained increased importance.

The management of public sector services is obliged to leave the sphere of traditional concerns, with predetermined rules and procedures and to consider more the public and the services. Since the traditional bureaucratic model of management and control is increasingly replaced by a decentralized, services-oriented system, public service managers must assume greater responsibility for decision making. Consequently, they must incorporate strategic thinking, operating with more comprehensive concepts and objectives that go beyond traditional functional boundaries. They need to guide their action towards the provision of services, while remaining in public service, but improving their work and looking out for the prudent and efficient use of public money[5].

Managerial development should be seen as an important factor in successfully achieving these requirements and others that will come with time. They have to be constantly taken into account.

What kind of leaders?

Ideas on the nature of leadership affect not only private institutions and organizations, but the entire political system of a country, its government and the educational system design. The belief that leaders are people who have certain characteristics that they were born with, or acquired early in a suitable environment, leads to the idea of a desirable educational system designed to develop leaders.

In business, great leaders are easily retained by the collective consciousness for their wealth: Henry Ford, Bill Gates, etc., as a measure of their success. In the public domain, the collective consciousness retains great leaders of nations, armies, religions and states, not at all some directors of a public service, for whom the assigned term is often “clerk”. The need for leadership in the public sector is not part of the tradition, but is affirmed by extensive and complex studies that refer to the new reality of the public administration.

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[5] *Idem.*, p. 28.

It is obvious that the external environment of organizations, either private or public, is now more more than ever subject to change the current financial crisis is an eloquent sign of this.

It is equally obvious that leaders are required to implement these changes successfully. If management was created to ensure order and stability in the presence of time and financial constraints, leadership was and still is a producer of motion, change, adaptation to the environment and anticipation of environmental change. Its features are best expressed by terms, such as values, personal qualities and innate talents like common sense, intuition, flair and ability to inspire the subordinates and to share the positive aspects of organizational experience.

Why are leaders important?

- Leaders lead through changing times;
- They determine the direction;
- They move the organization from where it is to where it should be;
- Leaders make things happen;
- They shape the culture of the organization;
- They have modern management tools;
- Leaders are drivers of change;
- They see reality with objectivity;
- They mobilize resources;
- They encourage others to follow.

Organizations, where leaders are present, function as a community, not a hierarchy. They give their members autonomy and offer opportunities to promote as well as motivational rewards. Thus, leaders acquire the voluntary cooperation of the subordinates in achieving the objectives and goals of the organization.

In his study on leaders and their characteristics, Gary Johns elaborated a typology based on the role leaders' play in changing the behavior of subordinates[6], so we have:

- transactional leaders, who make a direct exchange with the subordinates, the subordinates behave well, the leader rewards them, or the leader uses a participatory style, his subordinates respond with new and good ideas;

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[6] Gary Jones, *Comportament organizațional*, Editura Economică, București, 1998.

- transformational leaders, who provide a new vision that instill a real commitement in the subordinates.

Both the transactional and transformational leaders have some specific features that encourage devotion and substantial effort to the subordinates, are good at transactional aspects, such as tracing the route to goal and reward performance, but the researcher Bernard Bass[7] noted three qualities that separate the transformational leaders from the transactional: intellectual stimulation, individual consideration and charisma.

We believe that the type of leaders who can successfully cope with current challenges and can best make the necessary changes is the type of the transactional leader.

The defining features are:

- seer, critic of the disfunctionalities that prevent the organization from progressing;
- visionary, the one that brings a salvatory solution;
- ablity to discover followers and indoctrinate them in the new vision, up to the point of sacrificing their own interests;
- manipulator of events, speeding the favorable ones, restoring the trust in success;
- perseverance and patience in the pursuit of translateing its vision into practice;
- empathy towards the members of the organization;
- intelligence and intuition in preventing undesirable effects due to external or internal actions;
- good communicator in order to inform, share and explain his/her vision;
- organizing efficient structures.

Conclusions

The source of inspiration for public management is business management. The inventory of instruments used in the management of public organizations is given by managerial science.

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[7] Bernard M. Bass, *Leadership and Performance*, N.Y. Free Press, 1985.

At present, the management of the Romanian public organizations faces the persistence of the bureaucratic model (see The Public Servants Statute), in the conditions of the penetration of the new public management (targets, efficiency, standards, etc.). As a taxpayer noticed, it is ironic that the best private organizations have abandoned the mechanistic models, while the public sector maintains them.

For the Romanian public administration reform, there is much delay for the moment. We need competent leaders identified, prepared and set into value.

The Common Assessment Framework – CAF[8], proposed by the European Institute of Public Administration EIPA, defines a criterion for evaluating the leadership of a public organization. Thus, the question arises: What is the organization's leadership doing to motivate and support people in the organization and how do they act as a role model?

- Leading by example, thus acting in accordance with established objectives and values.
- Demonstrating a personal willingness of leaders /managers to accept change by acting on constructive feedback.
- Keeping employees regularly informed about key issues related to the organisation.
- Supporting employees by helping them carry out their duties, plans and objectives in support of the achievement of overall organizational objectives.
- Stimulating, encouraging and creating conditions for the delegation of authority, responsibilities and competencies including accountability (empowerment).
- Promoting a culture of innovation and improvement by encouraging and supporting employees to make suggestions for innovation and improvement and to be proactive in their daily work.
- Recognising and rewarding the efforts of teams and individuals.
- Respecting and addressing individual needs and personal circumstances of the employees.

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[8] *The Common Assessment Framework (CAF) 2006. Improving an organisation through self-assessment*, EIPA, Maastricht, 2006.

The role of leaders is to produce a radical change in the culture /mentality of the government if improvement in its efficiency and effectiveness is wanted.

The question is how the culture / mentality can and should be changed. The prospect is to appeal to the core values. We need to develop and grow a culture / mentality:

- Where talent can afirm and flourish,
- Where initiative is second nature, and not a step that requires approval, or some risk involving punishment or reward,
- Where energy and non-conventional ideas flow instinctively and are encouraged
- Where personal responsibility for the organization's performance is identified with the personal and colleagues' performance
- That encourages and appreciates success and effort at all levels,
- In which a variety of talents and skills are recognized,
- Where the search and provision for support, even at the highest level, is seen as a sign of strength, not weakness,
- In which renewal and adaptation to a changing environment is second nature
- Which shows the confidence born of recognition and development of skills, talents, and the natural human disposition to succeed.

Only cultures that facilitate change and adaptation to the environment produce long-term performance. Kotter and Heskett describe a culture open to adaptation and change as having the following characterristics: a strong leader with a career within the organization, but also open to the outside; a strong emphasis on the quality of relationships with different partners: shareholders, customers, employees; an activity of communication and participation that enable the creation of an own way to act, taking into account the external environment. In this way, a culture model is defined, generating long-term performance. A culture with a strong trend towards organizational excellence, and a weakened bureaucracy are two essential ways to increase performance of public organizations.

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Foreign Direct Investments (FDI) – A Factor of Economic Liberalization and Reduction of Protectionist Barriers[1]

Alina-Petronela HALLER

ABSTRACT: Among the factors that determine the intensification of the process of economic liberalization and on which both growth and development depend, a quite important place is occupied by the foreign direct investments. There is no classical or modern macro-model where they would not appear, starting with J.M.Keynes' *investment multiplier*. Foreign direct investments have become the most important source of funding for all of the world states, regardless of their degree of development, representing the active factor of the latter and the instrument by which each national economy can integrate itself and adapt itself to the global one. Economic liberalization allowed the rise of economic achievements, especially in the case of the developing countries, by attracting foreign direct investments. When the GATT and especially the GATS rulings were established, the trade in services was liberalized, including the foreign direct investments as part of the trade agreements. Foreign direct investments are related to the activity of the multinational organizations whose power has very much increased following the economic liberalization.

KEYWORDS: *foreign direct investments, liberalization, protectionism, growth*

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Foreign Direct Investments (FDI) – concept, definition, typology, motivation, advantages, disadvantages

Investment is defined as the active factor of development and adaptation of the economy to the requirements of the market and of competitiveness[2].

Foreign investments represent the totality of the expenses that are made in order to acquire the capital assets or to increase or replace the existing stock of capital. *Graham* and *Krugman* define the *foreign direct investments* as the "property on assets by a foreign resident with a view to controlling these assets[3].

The role of investments is so complex because they can influence the property structures, the economic structures on field and subfields of activity, technological structures and the structure of the labour market with direct consequences at the economic and social levels.

The classical definition is that an organization makes *foreign direct investments* when physical capital is directed towards another country, with a view of establishing another subsidiary company. Buildings, technologies and equipments, for instance, form a part of this category. About two thirds of the foreign direct investments are made as fixed capital (equipment, machinery, tools, buildings) and concern the big international corporations and conglomerates[4]. Foreign direct investments equal the transfer of an "industrial package" made of capital, technology, methods of industrial organization, managerial expertise, marketing knowledge, etc. that allow the investor to exert the right of control on investments[5] (generally, a participation of the foreign investor of over 10-25%).

The extremely fast changes of the technologies, the rise of the degree of economic liberalization, the modification of the national and international rulings regarding the investments, the financial innovations and the deep changes on the capital markets, have led, over time, to changes as regards the volume and manner of administration and orientation of foreign direct investments. The increasingly higher technologies, especially those in the field of communications, and the cost reductions have facilitated the management process of foreign direct investments. The changes have occurred in the pathology of the economic policies, especially of the commercial ones, following special attention paid to the economic liberalization in all four directions (capital, persons, goods and services), especially by the quasi-total elimination of the commercial and tax barriers, the imbalances and the privatizations in many fields of economic activity are all elements that have contributed to placing the foreign direct investments in the category of the main factors of economic growth and development in the current society.

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[2] Elena Moise, *Investiţii străine directe*, Editura Victor, Bucureşti, 2005, p. 19.

[3] Edward Grahom and Paul Krugman, *Foreign Direct Investment in the United States*, Institute for International Economics, Washington, 1989, p. 28.

[4] Jeffrey P. Graham, Barry R. Spaulding, *Understanding Foreign Direct Investment (FDI)*, www.citibank.co.uk, 2010.

[5] Elena Moise, *Investiţii străine directe*, Editura Victor, Bucureşti, 2005, p. 21.

Foreign direct investments (FDI) suppose, most of the time, relations between a parent company and its subsidiaries in other countries. As we have already said, these are associated with the activity of the multinational companies[6]. For an investment to enter the category of foreign direct ones, the parent company should hold at least 10% of the ordinary shares of its external subsidiaries.

The effect of foreign direct investments is most clearly perceived in the developing countries that have turned their attraction into a priority objective of economic growth. In spite of their substantiated effects, there are theorists who support and theorists who do not support their positive role. The adepts of the concept think that both the receiving and the emitting countries have benefits from these types of investments, while the adversaries of the concept believe that the multinational companies exert great power over the countries with weak economies, who cannot cope with the competition and who do not participate in the category of the competitive countries of the world. In reality, both the adepts and the adversaries of the concept of foreign direct investments have plausible arguments to rely on.

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[6] According to *Dicţionar economic şi financiar, the multinational or transnational company* is a commercial company that, since its establishment, has based upon elements with no national character (the capital, for instance, comes from associates from different countries, while several headquarters may exist in different states), which are deprived of juridical relations with a given state, so that no national law gets primacy on it; the litigations in the interpretation and enforcement of their constitutive acts are completely or partially out of the competence of the national courts and entrusted to special courts (the international jurisdiction courts, for instance, an arbitrary international court); as for their economic side, the characteristic is the fact that they always extend their activity of production and trade concomitantly on several markets as part of a vast network of personal implantations made by direct investments of capital abroad.

For the companies with enough financial power, foreign direct investments represent the opportunity to become active in other markets, by externalizing their production.

Types of foreign direct investments (FDI)

Investments are classified according to several criteria, the most known classification being that of investments:

- *of portfolio* – the dominating ones until the end of World War II; they involve the acquisition of foreign movable assets (shares, bonds) from a financial market and they allow for the participation in the decision making process but not in the right of control[7];
- *foreign direct* ones – dominating after World War II; they involve the purchase of the voting stock, of enterprises or the construction of enterprises abroad, the participation in the increase of the capital of a subsidiary and the granting of loans to a subsidiary from the parent company[8].

When the investment involves transferring towards the emitting organization the possibility of decision and control upon a third market organization, then it is part of the *foreign direct investments*. In case the investor does not take a controlling and decision interest; the investment joins the category of *investments of portfolio*. Whereas the *investments of portfolio* represent a purely financial investment, *foreign direct investments* are a combination of financial and real investments.

According to the restrictions imposed by their orientation, *foreign direct investments* are:

- *passive*: State-supported investments with a view to reducing the associated risks by fiscal stimulus and different forms of risk discouragement. For instance, the measures to reduce the risks taken by the local companies and the governmental subventions granted to them restrict the foreign direct investments abroad;

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[7] Elena Moise, *Investiţii străine directe*, Editura Victor, Bucureşti, 2005, p. 21.
[8] *Ibidem*.

- *active*: encourages by facilities for loans, fiscal facilities, subventions, elimination of restrictions and limitations.

According to the orientation of their flow, *foreign direct investments* are:

- *vertical*: they occur when a multinational holds a percentage of stock of a foreign company that provides it the necessary raw materials in the production process. They are the result of an upstream-downstream relationship;
- *horizontal*: they occur when a multinational organization carries on the same type of activities in several countries.

Foreign direct investments are mainly achieved by fusions and purchases. The best-known forms of foreign direct investments are:

- *licenses, technological transfer* – these suppose a relationship between the academic research environment and the economic one. The results of the researches, concretized in innovations and prototypes take shape in the organizations with a view to achieving and bringing on the market new competitive products. The license agreements allow the organizations to benefit from all the advantages of the new high-standard technologies and limit the risks associated to the incipient phases of production up to the maturation of the technological products and the initiation of the research of new products. The license is a commercial transaction by which the owner of intangible assets (patent, brand, copyright, know-how, etc.) sells to a buyer (grants license) the right to use it in exchange for a fee[9]. A license also supposes technical and legal assistance, being a combination between export and direct investments;
- *mutual distribution agreements* – these types of strategic alliances are based upon commercial interests and represent a theoretical point of view, a form of foreign direct investments. Usually, two companies in the same field of activity or from similar fields of activity agree to operate as national distributors of their products. Both companies receive access to the networks of distribution of the partners, avoiding the high costs of distribution or those associated to that, but without any of them invading the sale market of the other;

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[9] Vasile Işan, *Tranzacţii comerciale internaţionale*, Editura Sedcom Libris, Iaşi, 2004, pp. 48-49.

- *contracting the industrial manufacture or processing* – is situated between license and direct investments. An organization totally or partially canalizes its production towards a partner in order to sell its products on the market or on third markets. Marketing and distribution remain in the partner's competence, while the organization can take responsibility for the achievement of a transfer of technology and technical assistance;
- *joint venture alliances* – covers, on a wide scale, all forms of association between companies with headquarters in different countries (between a local company and a foreign company, between a State local company or local public administration, between several foreign companies)[10]. The traditional joint venture alliances are bi-lateral, that is they involve two parties in the same field of activity who become partners with a view to obtaining some strategic advantages (for instance, access to the partner's technology, to its intellectual capital – the more highly qualified and relatively expensive human resources on the market, access to the distribution channels in a given country or region). One of the reasons why the joint venture alliances involve only two parties is the difficulty to integrate several corporatist cultures. The process of integration of the partner's corporatist culture is difficult, including the case when the companies come from the same country. In case the companies are from different countries, this process is sometimes almost impossible. So this explains the reasons for the failure of a great majority of joint venture alliances in the first five years after foundation. In case an alliance involves more than three partners, it is called a *consortium*. The role of the consortium is so the partners become involed in developing giant projects. The consortiums are easier to administrate, because projects impose limits, by their hugeness and objectives, to each partner, and direct cooperation is not absolutely necessary;
- *greenfield investment* – on an "empty field" or "from zero" suppose the establishment of subsidiaries in integral property with substantial capital investments, the utilization of the investor's human resources and the transfer of know-how abroad. Actually, the investor's assets are integrally utilized. If, in the case of the license and joint venture, managerial control

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[10] Vasile Işan, *Tranzacţii comerciale internaţionale*, Editura Sedcom Libris, Iaşi, 2004, pp. 55-56.

is easy to lose, this risk does not exist in the greenfield investment case, though, on the whole, the risks involved are bigger, because the company should bear alone all the investment and operational costs in an uncertain environment[11];

- *portfolio investments* – are theoretically part of the category of indirect investments, but over the last decades, when the interest for foreign direct investments significantly increased, the portfolio investments were included in the category of the indirect ones, especially if the value of the directed capital was not sufficiently attractive for the shareholders or owners of a company. Yet, by the portfolio investments, companies with modest investments in a third organization can use the power of the vote in order to take over control of the company management where they hold shares. This is a "shadow alliance". In fact, even if most of the portfolio investments do not enter the category of the foreign direct ones there are situations when they behave in the same exact way.

Justifying factors for foreign direct investments

The justifications for the achievement of *foreign direct investments* are diverse. The parent company can aim at: strengthening its position on the market, developing opportunities on third markets (finding new sources of resources and raw materials, finding resources or raw materials at a better price-quality ration than on the origin market of the company, finding advantageous fiscal conditions, etc.). Whichever the justification or the justifications of the achievement of foreign direct investments might be, the final objective is the economic growth and development favoured by a better economic openness.

In an economy with a *vast potential of economic growth*, foreign direct investments constructively support the process of economic and social development. For this, the multinationals direct their investment flows towards the markets of the developing countries, as they have a bigger potential of growth and development.

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[11] *Idem.*, p. 67.

In case the flows of foreign direct investments are oriented towards export activities, the *dimensions of the market* of the host country's economy are important because they are proportional with the possible economies of scale that can be obtained as well as with collateral positive effects.

The *population* of a host country is also important because the multinationals direct the flows of foreign direct investments towards markets with a higher number of potential clients who could ensure the sale of production, an adequate turnover and profit.

Very attractive are the markets where the *incomes per capita and the inclination to consumption* are high enough, because these indicators, at a higher level than in other states, almost guarantee the success of the activity on that market.

The *level of qualification and the price of labour* are extremely important for the attraction of flows of foreign direct investments. The higher the qualification is, and the lower the price of labour, the more attractive the market becomes for the foreign investors. Many times, this is the only justification for the orientation of the flows of foreign direct investments, especially on the markets of the developing states. Cheap labour considerably reduces the company's funds of salaries, the main component of the production costs.

Another justification for foreign direct investments is the *equipment of some markets with natural resources, especially from the category of the strategic ones*, like petroleum, coal, power, etc. The more abundant these resources are on a market, the cheaper they are, theoretically at least, and they do not require, under given circumstances, transportation and depositing expenses.

Part of the category of attraction or justifying factors for foreign direct investments is also transportation, communications, etc. *infrastructure.* A modern and complex infrastructure reduces distances, facilitates transporttation between different markets of production and sales, and increases the degree of transparency, by facilitating the access to information.

The *attractive economic policies*, especially the fiscal ones, and the external openness by the affiliation of the host country to certain regional groups and commercial agreements of free trade, motivates or demotivates a multinational to direct its flows of foreign direct investments towards some given markets. By foreign direct investments, the production is preferred to be placed on the market of countries with a low tax degree or which can be "doors of passage" towards and from other outlets without or with few restrictions of importation and exportation.

Economic legislation also plays an important role in attracting foreign direct investments. It had been often changed with a view to becoming more attractive for the potential investors and their interests. The countries benefiting from foreign direct investments elaborate and promote laws adequate to the commercial policy of attracting investments with a view to raising the population's standard of life and economic development. Thus, the effort to attract foreign investments becomes a component of the economic policy and laws of the State, with a direct orientation towards the improvement of the interior economic situation. The attraction of foreign direct investments suppose the creation of adequate legislation, the creation of a favourable legal framework by which discriminatory measures could be avoided, which could guarantee and protect the investors' activity.

Economic, social and political climate has its own set part to play. Safety on the three levels is a guarantee of success on a market. It is demonstrated that a internal or external imbalance (like for instance the economic crises, the political crises, strikes or social riots) discourage the investors, who either give up investing or diminish or even withdraw their investments in case of grave market perturbations.

Advantages and disadvantages of foreign direct investments

Advantages of foreign direct investments

The bigger the foreign direct investments, the more labour opportunities they create, especially on the markets of developing countries.

Emerging states are motivated to create the conditions to attract foreign direct investments, as long as technological and managerial competences transfer occurs.

Theoretically, foreign direct investments help by raising the total and per capita incomes. In reality, the individuals with low incomes are affected by the State decisions and the decisions of the big companies to keep a low level of salaries on the market. One of the main factors that encourages multinational companies invest on a developing market is the maintenance of low costs with the salary funds.

Foreign direct investments:

- represent the material basis of economic and social development;
- ensure the quantitative and qualitative rise of fixed capital;
- ensure the rise of technical efficiency of the already existing capital;
- increases the supply of employment;
- ensures an increasing degree of resource utilization;
- ensures a high degree of employment;
- ensures the improvement of technological processes, the extension and generalization of the principles of economy and society management;
- ensures the modernization of the economic activity as a requirement for the adaptation of technical-economic systems and for the participation of each country in the international economic exchanges under competitive conditions.

The macroindicators like the gross domestic product (GDP), the gross national product (GNP) or the national income (NI) are correlated with investment efforts. Investments have a multiplier role in the economy, which is reflected in the rise of income[12]. The reverse is also valid. The rise of income is reflected in the rise of investment and is expressed by the accelerator of investments[13].

Foreign direct investments are correlated with the activity of foreign trade, which is facilitated by economic liberalization. The activity carried on by the foreign investors on another country's territory encourages the local economic agents and the domestic production.

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[12] The *multiplier of investments* is determined by the ratio between income and investments that expresses the income increase obtained following a one unit increase of the achieved investment. (Ion Ignat, *Economie politică*, Editura Economică, Bucureşti, 2002.)

[13] The *accelerator of investments* is calculated as a ratio between the investment variation and the income variation, and it expresses the investment increase obtained when income is increased by one unit. (Ion Ignat, *Economie politică*, Editura Economică, Bucureşti, 2002).

Disadvantages of foreign direct investments

Foreign direct investments have advantages but also disadvantages. The latter are correlated with problems related to the functioning and distribution of profits.

The biggest disadvantage is an indirect one, referring to the relationship between the economic rise and foreign direct investments. In the case of the developing countries, in particular, the decrease of the flow of foreign direct investments is almost surely followed by a reduction of the ratio of economic growth.

There are situations when some measures of foreign politics and of stimulation of foreign direct investments penalize the labour force from the receiving country. On the one hand, we speak about creating employment opportunities, on the other hand about a relatively reduced level of the average salary.

Other disadvantages, especially in the case of the economies emitting foreign direct investments are related to costs and distances, to cultural differences and language barriers, to economic and social and political instability on the markets where these investments are directed.

An unfavourable situation and a great challenge for foreign investors appears when the economic and political relationships between the receiving country and its neighbours are precarious.

Foreign direct investments in Romania under economic crisis conditions

The economic growth and liberalization of the Romanian economy in the period after the 1989 Revolution based upon a group of factors with a different impact in the real economy and especially in the medium and in the long run: domestic consumption, foreign trade (export and import), foreign direct investments, technological and informational development, integration in different regional groups (particularly the European Union – an objective that was reached in 2007), etc. Although, naturally, we speak about a series of factors that played, one by one or all together, the role of economy's *engines*, the common denominator, regardless of the objectives and of the period, were the *export* and the *foreign direct investments*, two inter-dependent and inter-influent factors.

The change of system aroused the interest of foreign investors, who saw on the Romanian market big opportunities of gain. Although the risk and incertitude level was maintained on the market, almost always at a high level, the foreign direct investments recorded a continuously increasing tendency until 2008, except for the year 2007, on the background of the world economic crisis and of the strong incertitude accompanying it. The value of the foreign direct investments in Romania, in the period 2003-2010 is presented in table 1.

Table 1. Foreign direct investments in Romania – 2003-2010 – millions of euros

Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
FDI value	1946	5183	5213	9059	7250	9496	3488	2269

Source: *Balance of payment*, Romania's National Bank, http://www.bnro.ro/Publicatii-4.aspx, 2011.

Note: the values for 2010 represent forecasts, while those for 2011 represent estimations.

The year 2008 was the climax as for the attraction of foreign direct investments. The accentuation of the economic crisis led to a decrease, in 2009, of 2.72 times compared to the previous year, that had a 63.27% decrease. It was forecasted that the value of the foreign direct investments in 2010 was 2269 million euros; that is 4.18 times lower than in 2008, that with 76.11% and with 39.94% compared to 2009, while for 2011 the forecasts are not partially encouraging, especially for the second half of the year, because of the country's rise in rating as regards the investments.

The first part of 2011 was characterized by a reduction of foreign direct investments, by 22% compared to the same period of 2010, a worrying point if we think that in 2010 the level of foreign direct investments was the lowest over the last seven years[14].

The biggest part of the foreign direct investments took the form of capital shares and of intra-group credits. In 2010, the capital shares amounted to 2.04 thousand million euros, and the intra-group credits were 556 million euros[15]. The biggest percentage of the foreign direct investments' value was directed towards industry, 41.4%, followed by the financial intermediaries and insurance, 19%, construction and real estate transactions at 12.9%, trade at 12.3%, information technology and communications at 6.5%, transportation at 1.4%, agriculture, forestry, fishery at 1.1%, hotels and restaurants at 0.4% and other activities at 5%[16].

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[14] *Fragmente din mozaicul incompetenţei (XII) – investiţiile străine directe şi inflaţia*, http://transidania.worldpress.com.

Before the moment when the world economy entered the crisis, the main factors of attractiveness for foreign investors were: the level of unique quota, the efforts of economic recovery motivated by the fulfilment of the conditions of pre-adherence to the European Union, the wide sale market, the relatively high qualified and cheap labour, etc.

For the 2004-2006 span, UNCTAD placed Romania on the 21st position in a 141 country classification for which the index of efficiency of the attracted foreign direct investments was calculated.

Table 2. The index of the FDI efficiency attracted in the 2004-2006 span

Country	Position	Index
Luxemburg	1	17476
Hong Kong (China)	2	9630
Bulgaria	7	7000
Romania	21	3791
Great Britain	34	2670
Ukraine	37	2670
Hungary	38	2603
Turkey	73	1413
France	74	1394
Italy	106	0,654
Greece	114	0,547
Ireland	141	-2202

Source: ***, *World Investment Report*, (UNCTAD, 2007), 220; taken from http://www.fiscalitatea.manager.ro

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[15] http://www.arisinvest.ro / Romanian Agency for Foreign Investments.

[16] *World Investment Report*, (UNCTAD, 2007), 220; taken from http://www.fiscalitatea.manager.ro

UNCTAD situates Romania, in the 2004-2006 period, characterized by economic growth, on the 21st position from the point of view of the efficiency of the foreign direct investments, before Hungary, the country in Central and Eastern Europe that turned foreign direct investments into the main factor of economic growth and development, before France, Italy or Ireland.

From the point of view of the potential of attraction of foreign direct investment, Romania occupies only the 76th position. Although their effectiveness in the Romanian economy was relatively high compared to the markets of other more developed states, the potential of attracting foreign direct investments was much lower, justified by the high degree of incertitude and by the risk associated with the Romanian market.

Table 3. The index of the potential of attraction of FDI in the 2004-2006 span

Country	Position	Index
USA	1	0.623
Great Britain	3	0.445
Luxemburg	5	0.427
Germany	6	0.426
France	15	0.387
Spain	25	0.340
Italy	29	0.308
Hungary	41	0.265
Bulgaria	60	0.204
Turkey	69	0.185
Romania	76	0.176
Congo	140	0.041
Zimbabwe	141	0.021

Source: *World Investment Report*, (UNCTAD, 2007), 220; taken from http://www.fiscalitatea.manager.ro

The UNCTAD analyses show that between the potential of attraction of the foreign direct investments and their efficiency there is no equivalence. There are very attractive markets for foreign investors where the investments prove to be less efficient. The biggest attraction was the American market, as expected. Generally, the economies of the developed states are more attractive because they grant the investors a higher degree of economic, social and political stability, and a much lower risk degree compared to the economies of the developing countries. Romania occupied the 76th position in the classification of the 141 states analysed by UNCTAD from the standpoint of the attractiveness of the foreign investors, after Hungary and Bulgaria. The economic crisis that affected the Romanian economy and the austerity measures imposed with a view to the economic recovery encouraged foreign investors and decreased the efficiency of the investments as well, as the recorded, estimated and forecasted values prove.

Conclusions

The role of *foreign direct investments* is as complex as it is important. First of all, these are the easiest instruments to enter new outlets in order to sell production, in order to reduce the cost of production, in order to have access to new technologies, products, human and financial resources.

For the country that receives *foreign direct investments*, especially if this is about developing countries, they are, among others, sources of competitive technologies, capital, products and new methods of organizational management, which renders the impact on the economic growth and development a major one.

Technical progress in the field of communications and economic liberalization has created new opportunities for the achievement of foreign direct investments at an increasingly higher value and has accentuated their motive role in economy, especially until the world economy entered the recession. Several states, especially the industrialized ones, by their economic policies, pay a special attention to the *foreign direct investments* because the flows going in or out the economy have a particularly high impact, an aspect demonstrated by the developing countries, especially in Eastern and Central Europe, which in the period of transition from the system of centralized economy to the market economy got high rates of economic growth due to the flows of *foreign direct investments* they attracted.

Foreign direct investments represent a major source of growth of the inflows, of acceleration of the process of economic growth and of consolidation of the process of development, transfer and implementation of the advanced technologies, of the managerial qualities and of the marketing activities, motivating the world states to liberalize their markets and lift the protectionist barriers.

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Creativity to the Individual in Society Knowledge

Victor GHERMAN
Corina MATEI-GHERMAN

ABSTRACT: Mind and human mind have evolved from small things (stone sharpeners) to the knowledge of the XXIth century. But man aspiring to achieve more creativity, considered at first a mystery is one person with exceptional qualities. Creativity manifests itself in all fields: science, technical, artistic creation, management, marketing, economics, etc. As a current trend, creativity is a driving force in solving the problems we face in the future, with major implications in the economy, corporate success and creativity of the employees. Individual research on creativity in the knowledge society is in its infancy. If people have a creative ADN, whether in the soul the desire to do "something creative", they will certainly find plenty of players that will redefine the creative progress in the knowledge society at the individual level.

KEYWORDS: *creativity, performance, innovation*

Results and discussion

Since ancient times, individuals have tended to become creative. An evolutionary process based on the use made of stone tools and a primitive society to knowledge society of the XXI century. In this context, people have always created "something" that has radically changed new living conditions of mankind, his way of thinking, to lead and provide new opportunities and threats, which to fight or to use to their advantage.

In the year 2011, where the general economic crisis tends to end and another is on the horizon of humanity and is the starting point of zero, the U.S., efficient use of natural resources which generously provides us the earth, is a matter of efficiency and creativity based on the creativity of an individual, group of persons, firm, a country, the EU and global reach of the decision with implications for economic performance, management, marketing, etc.

The concept of performance generally was born out of the human need to achieve more with effects as small. Performance, when the reference refers to a person in relation to a system of inherent determinants, enables us to progress or regress (nonperforming) that people, performance determined their performance as the individual attribute. In this benchmark, the performance of a person (P) is defined by the ratio of which is obtained from a particular action (O) and what the person consumes (C) to obtain that action, as follows:

$$P = \frac{O}{C} = \frac{O}{0} \longrightarrow \infty \quad (2)$$

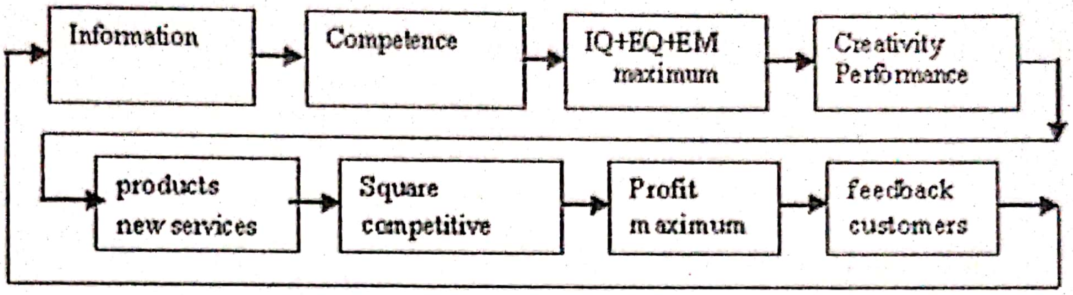
The report of the formula (1), the very human performance.

In the knowledge society, for a person performing whatever action is taken, the family, within a firm, a research team or decision, the return must be higher than one, respectively, to achieve greater effects by using the human brain.

From studies that 10% of individuals in a community perform with academic intelligence (IQ) very high emotional intelligence (EQ) creative intelligence management (EM) as creative and inspired, a maximum competence (c = 1) and to provide adequate answers from the set of possible answers. Obviously a person working in a group with a well defined purpose, it is necessary to have a competence figure closer to one and must go through several stages of evolution sequence of brain organization, a process that is called hope theoretical development only finally able to make the real human spirit possible through capacity, which alone can cause a person to act in the space where it locates a yield higher than one.

The direction of development of each person should follow the following route:

Figure No. 1. The direction of development of creativity / individual performance



Individual performance (inherent) and relative to a group of people carried; they do not ever overlap. Most performing persons do not overlap with the most performing person in a group, a group performance increases continuously with a relative peak performance.

Individual performance, IQ, EQ and MQ are dominated by inspiration. Moreover an equation (1) may take values that tend to infinity if the consumption resources to achieve a unity of effect is zero, then the report is:

$$P = \frac{O}{C} = \frac{O}{0} \longrightarrow \infty \qquad (2)$$

This maximum corresponds only to the Creator. For human beings, things are different. However there have been people in Romania throughout history who perform higher than one such as: George Enescu, Constantin Brancusi, Anghel Saligni, Aurel Vlaicu, Gheorghe Zane, etc.

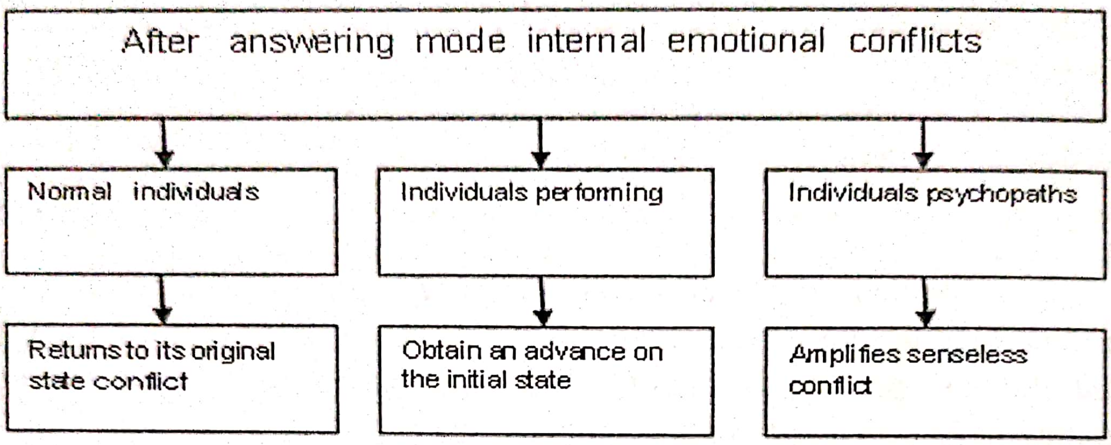
Causes of individual performance

Performer, the central figure in the knowledge society influences individual creativity and efficient actions. The performer does internal causes and external causes, challenges by exploiting the feedback influence of each other.

The literature places the individual's performance roots in state processes emotional pressure caused by challenges, often by orders outside the creative process following a space, following a trend towards direction by a purpose.

After people are have responded to internal conflicts of an emotion can they be grouped into three main categories:

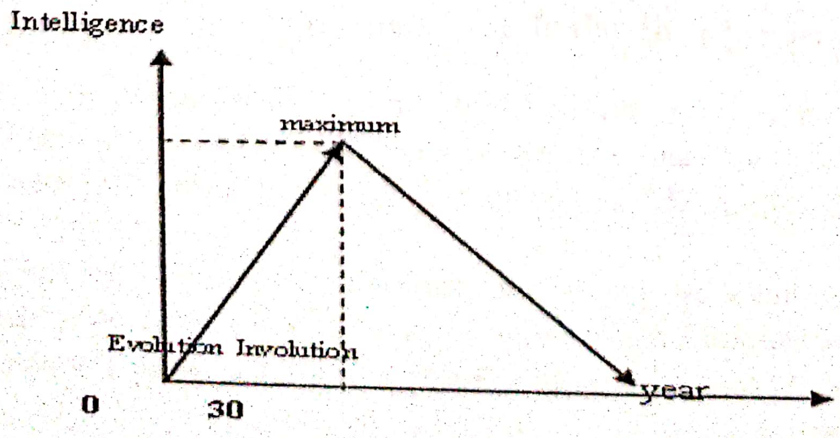
Figure No. 3. Classification of individuals by way of response to emotional conflict within


After answering mode internal emotional conflicts
Normal individuals
Individuals performing
Individuals psychopaths
Returns to its original state conflict
Obtain an advance on the initial state
Amplifies senseless conflict

A performer puts his/her questions and seek answers constantly, using both hemispheres of the brain – the left to make new combinations and the right creative, inspirational. It shines and leads to revolutionary creations. But creative ability can be developed using performer continues the brain, which develops a large number of neural connections needed for a large number of responses' performances. Thus, people occupied with intellectual work – engineers, teachers and researchers, have average intellectual development of 108.5 compared only 92.8 to those who practice other work that requires no intellectual effort.

Individual intelligence is closely related to age.

Figure No. 4. The evolution of personal intelligence



The literature states that – during the creative – individual can go up to about 30 years, then begins to decrease gradually. This is why Western countries determined to seek and commit graduates, intellectually gifted in Romania.

A Japanese study conducted by Japanese and European subjects, using the Wechsler intelligence test, concluded that in the last 70 years, Japanese IQ increased to 107 while the Europeans remained steady at number 100, and the percentage of those gifted with an IQ-130 was 10% in Japan and only 2% for the Europeans and Americans.

This is reflected in the different performance of the Japanese economy, American and European. Applying the European Union intelligence test we could find some answers to the European Union which failed to become the most performing economic group in the world. To this we add the lack of performance of national economies, social policies in the long term, the collision of cultures and religions which adversely affects the performance of the European Union and Romania.

Using the Gauss curve for determining the coefficient, intelligence is based on the fact that:

$$IQ = \frac{\text{Mental age}}{\text{Biological age}} x 100 \quad (3)$$

conclude that:

- IQ = 85 to 115, have normal intelligence;
- IQ = 116 to 130, have higher intelligence;
- IQ = 131 to 145 have an exceptional level of intelligence (about 2-3% of the population);
- IQ = 146 have more to do with a genius level (0.13% of total population).

Outs based on the fact that if in (3) IQ = 100, the respective mental age is equal to the biological age, life expectancy respectively. The individual has a higher IQ, determined and successful assimilation of higher education, better health, performance becomes the leader, sets out the directions of development of human society, are the persons sought, hunted by the big economic powers and live 15 years longer than the average.

In Romania there have been tests on intelligence across the company to determine the degree of intelligence that could turn the Romanian economy and society on a better vector, to, creativity, innovation and progress.

He believes that every person performance is a wrong concept. The creators have "discovered" and been promoted to positions of high motivated decision. There is no other way in the knowledge society.

There are some personalities who decisively influenced the development of human society and their intelligence coefficient, to support the claims above: Goethe - IQ 210, Francis Golton - IQ 200, Newton - IQ 130, Galileo Galilei - IQ 185; Descartes - IQ 180 ; Immanuel Kant - IQ 175; Charles Darwin - IQ 165; Rafael - IQ-100, Napoleon Bonaparte - IQ145, etc.

According to British Encyclopedia 1996: "Creativity is the ability to make, to produce something new".

In Romania, based on the individual and to the level of the legislature, it must be convinced that only through individual and collective performance will adequate answers to the challenges of the future knowledge society be found.

In conclusion, creativity is a mental process, leaving questions of emotional and spiritual answers spectrum in order to generate original responses in relation to a specific situation, thinking through a unique filter. Creativity is a skill that has general intellegence measured by the intelligence coefficient (IQ). But intelligence should be educated, cultivated with techniques and methods offered by the knowledge society, modern science, to be implemented and reached through new products or services on the market to generate profit and wealth to societies / companies / firms / families.

Companies with advanced economies like America, Japan, China, Germany, France, etc.., feature vectors, defining their strong creative performance. Romania is still on the road to creativity.

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Knowledge Based Society: an Empirical Research About the E-Procurement Adoption Process in Organizations From Maramures County[1]

Corina POP SITAR

ABSTRACT: Most of the purchasing researchers consider E-procurement as a strategic contributor to the added value of the organizations. This paper presents the main value added that E-procurement can add to the organizations. Furthermore, the paper presents a conceptual model of factors affecting the value added by E-procurement. In order to discover the influence of these factors on the capacity of the E-procurement to add value to the organization, we conducted an empirical study in the organizations from Maramures county. The preliminary findings of the empirical research are presented also in this paper.

KEYWORDS: *E-procurement, value added, knowledge based society*

Introduction

Peter Druker used for the first time the term "knowledge society" in 1969, but it was better defined by Mansell & When (1998) and Stehr (1994). We can find the keys to the knowledge society following the steps of what we call the information society, heading towards a much more collaborative global world of knowledge sharing: a globalization of knowledge.

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Nowadays, in the knowledge society, E-procurement has become one of the most important tools for improving the profitability of organizations. This reputation was earned because of the important contributions that E-procurement has on organizations:

- the major impact on costs reduction;
- the major impact on improving efficiency of the purchasing process;
- the major impact on improving management information and control over the purchasing process.

This article begins with a literature review about E-procurement and the main value that it can provide. Next, we identify the main factors that affect the value added by E-procurement. Furthermore, we present a conceptual model of factors affecting the value added by E-procurement.

In order to test this conceptual model, we used a questionnaire that was sent to fifty organizations from Maramures County. We also present in this paper the preliminary findings of the empirical research. At the end of the article we present the conclusions and we elaborate recommendations for further research.

Literature review on E-procurement

Over the last couple of years, E-procurement has received more attention from practitioners and researchers. E-procurement is a buy-side application of B2B e-business. It is an online trading and processing platform to support electronic acquisition of products and materials, plants and equipment, labor and services.

There are many definitions for E-procurement available in the literature. We choose to concentrate our attention on the following definition: "E-procurement is the use of integrated (commonly web-based) communication systems for the conduct of part or all of the purchasing process; a process that may incorporate stages from the initial need identification by users, through search, sourcing, negotiation, ordering, receipt and post-purchase review" (Croom and Brandon-Jones, 2007)

Nowadays there are many forms of E-procurement available on the market. In this article we choose to focus on the following forms of E-procurement (mentioned by Boer, Harink, Heijboer, 2002): ***E-ordering,***

Web-based ERP, E-sourcing, E-tendering, E-reverse auction, E-informing.

E-ordering

E-ordering focuses on the process of creating and approving purchasing requisitions, placing the orders and receiving the goods and services ordered using a software system based on internet technology. An E-catalog is used by all the employees from the organization for ordering items that are needed. In the case of E-ordering, the goods and services ordered are non product related (indirect goods and services).

Web-based ERP (Enterprise Resource Planning)

Web-based ERP is similar with E-ordering. The only difference is that in the case of web-based ERP the goods and services ordered are product related. ERP software packages are designed to optimize the resource planning of an organization.

E-sourcing

E-sourcing is the use of the Internet for the identification of new suppliers for a category of purchasing requirements. This is a method by which organizations can move their procurement process online in order to reach a larger number of suppliers than would be possible through usual channels.

E-tendering

E-tendering is the process of sending RFI (request for information) and RFP (request for proposal) to suppliers and receiving their response using internet technologies. Often e-tendering is supported by an e-tendering system that can analyze the responses received from the suppliers.

E-reverse auction

E-reverse auction enables the purchasing organization to buy goods and services needed from the supplier that has the lowest price or combination of lowest price and other conditions as well using internet technologies.

E-informing

Finally, e-Procurement can be used for the simple job of exchanging purchasing information between buyers and suppliers. By using Internet technologies, the process of accumulating a database of supplier information can be made much simpler than by using traditional contact methods.

Most of the purchasing researchers see E-procurement as a strategic contributor to the added value of the organizations .Review of the literature offers many examples of the value added by E-procurement. The main value added by E-procurement reported by several researchers (Monczka, Handfield and, Giunipero, 2009; Arbin, 2002) is reduced costs through various ways, including the followings: improving internal efficiency, cutting supplier costs, reducing order error rate, minimizing 'maverick' buying, etc.

Based on the findings from the literature review we tried to summarize the main value added by E- procurement (see table 1).

Table 1: The main value added by E-procurement

The main added value added by E-procurement	**Mentioned in literature by:**
Operational value added	
• Costs savings	Subramanian and Shaw (2002)
• Time savings	Knudsen (2003)
• Improved efficiency of the purchasing process	Weele (2010)
• Reduced operating and inventory costs	Egber and Tookey (2004)
Strategic value added	
• Greater management influence and control over the purchasing process	Knudsen (2003)

• Increased purchasing power of the purchasing specialists	Kalakota et al. (2004)
• Improved commercial relationships with suppliers	Hawking et al. (2004)
• Increased profit margin	McIntosh and Sloan (2001)
• Gaining competitive advantage	Wong and Sloan (2003)

We choose to classify the main value added by E-procurement according to their strategic importance into:

- operational value added
- strategic value added.

For organizations, it is most important to concentrate when implementing E-procurement on achieving all these value added.

Conceptual model of factors affecting the value added by E-procurement

Despite the value added that can be provided by the implementation of E-procurement forms, their adoption is still at their early stage (Davila et al., 2003). This happens because there are several factors that can affect the adoption of E-procurement and thus the potential value added by E-procurement.

Patterson et al. (2003) showed that there are some organizational and environmental factors that positively influence the value added that can be provided by the adoption of E-procurement. These factors are:

- organizational size
- supply chain strategy integration
- supply chain member pressure
- environmental uncertainty.

Based on a literature review we summarized the main factors that can affect the value added that can be provided by E-procurement (see table 2).

Table 2: The main factors affecting the value added by E-procurement

THE FACTORS	REFERENCE BY:
External factors • competitive pressure • supply chain member pressure • suppliers relationships / pressure	Kuan and Chan (2001) Min and Galle (2003) Subramanian and Shaw (2002)
Organizational factors • size of the organization • internal support structure and mechanisms • infrastructure issue and extent of integration • volume of E-transactions • company culture • user resistance to change • organizational skills set and resources	Patterson et al (2003) Subramanian and Shaw (2002); Min and Galle (2003); Osmonobekov et al (2002) Podlogar (2007) Rahim (2008) Sigala (2005)
Technological factors • complexity of the E-procurement application • implementation simplicity • reliability of the E-procurement system • compatibility with the other IT systems	Min and Galle (2003); Rahim (2008) Podlogar (2007) Rahim (2008)

We choose to group the factors affecting the value added by E-procurement in three main categories:

- environmental factors
- organizational factors
- technological factors

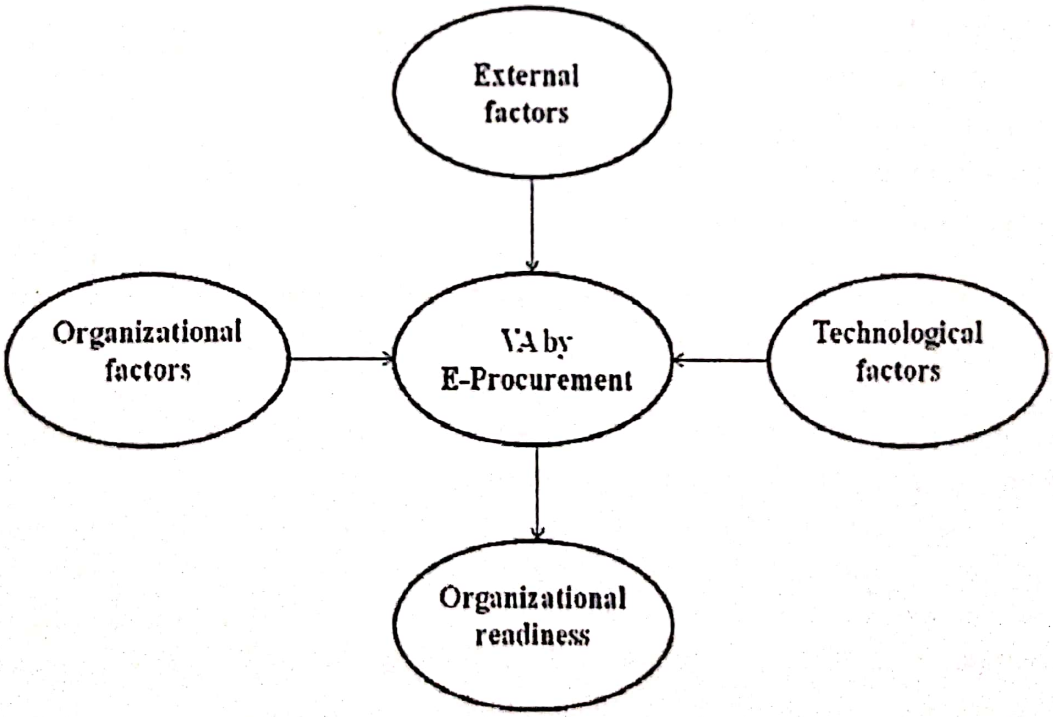
Each group comprises a number of factors that may affect the value added by E-procurement. For example, we found in literature that competitive pressure, supply chain member pressure and suppliers' relationships are the most important environmental factors that can affect the value added by E-procurement.

From the organizational factors we mentioned: organization size, internal support structure, company culture, volume of E-transactions, user resistance to change, organizational skills set and resources that can affect the value added by E-procurement.

An important role is also played in the following technological factors: complexity of E-procurement application, implementation simplicity, reliability of the E-procurement system and compatibility with the other IT systems.

Based on these findings from literature we have tried to group the main factors affecting the value added by E-procurement into the following conceptual model (see figure 1). Beside the three main categories of factors found in literature (external factors, organizational factors and technological factors), we added another category: organizational readiness.

Figure 1: Conceptual model of the factors affecting the value added (VA) by E-procurement



Organizational readiness refers to the availability of the company to implement E-procurement. This means that the company has the financial resources needed, a well defined implementation strategy and compatible IT systems.

Testing the model

In order to test the conceptual model of the factors affecting the value added by E-procurement, we decided to select five main categories of value added (see figure 2):

- cost savings (VA_1)
- time savings (VA_2)
- improved efficiency of the purchasing process (VA_3)
- greater management influence and control over the purchasing process (VA_4)
- gaining a competitive advantage (VA_5).

We also noted the factors affecting the value added by E-procurement as follows:

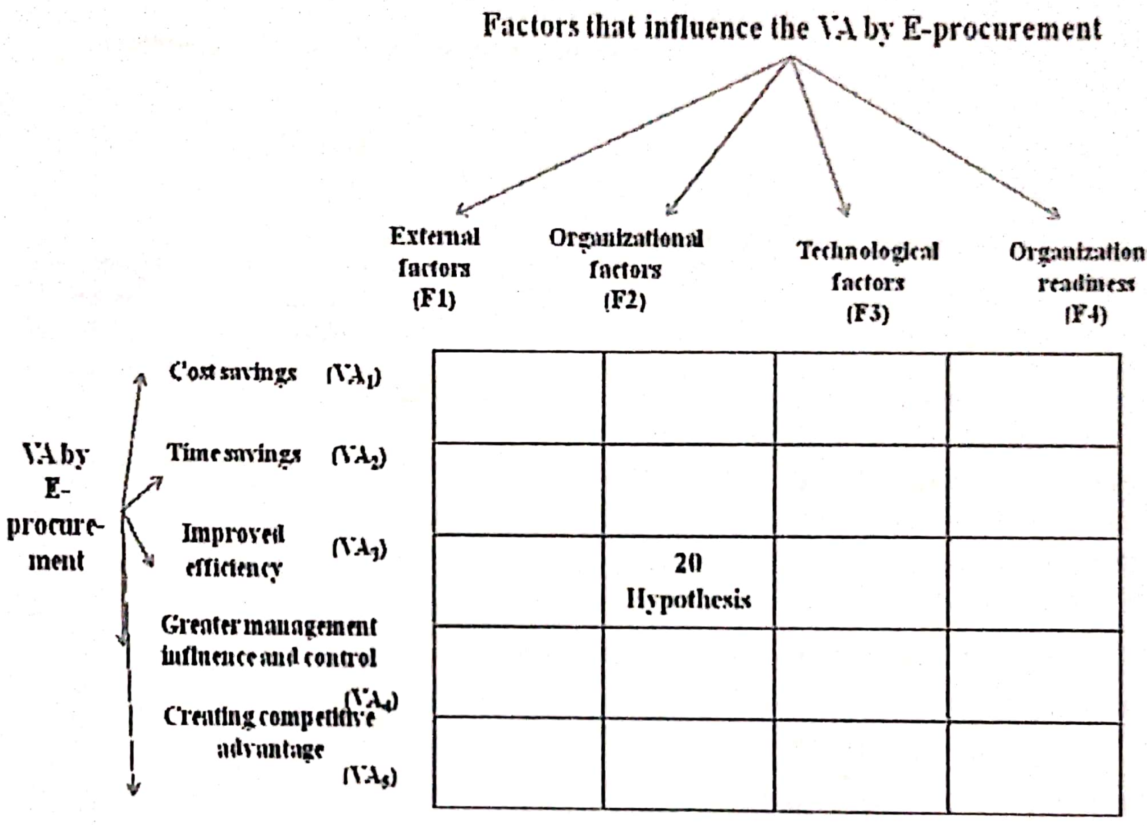
- external factors (F_1)
- organizational factors (F_2)
- technological factors (F_3)
- organizational readiness (F_4)

When it comes to discovering how the selected categories of factors influence the capacity of the E-procurement to add value to the organization, we operationalized the factors and the values added. In order to do this we formulated statements for each factor and each value added. The statements are very simple and allow only a yes or no response.

As a preliminary field test we surveyed 50 managers of organizations from Maramures County. The organizations were selected from different sectors of activity. We asked for a yes or no response for all the statements formulated. Then we studied the dependence between the values added and the factors affecting value added.

For the different combinations of factors affecting the value added and values added we tested the hypothesis (H_0) that a particular factor is independent from a particular value added. In order to test H_0 we used Pearson' s $\chi 2$ statistics (see appendix A).

Figure 2: The factors affecting the value added (VA) by E-procurement

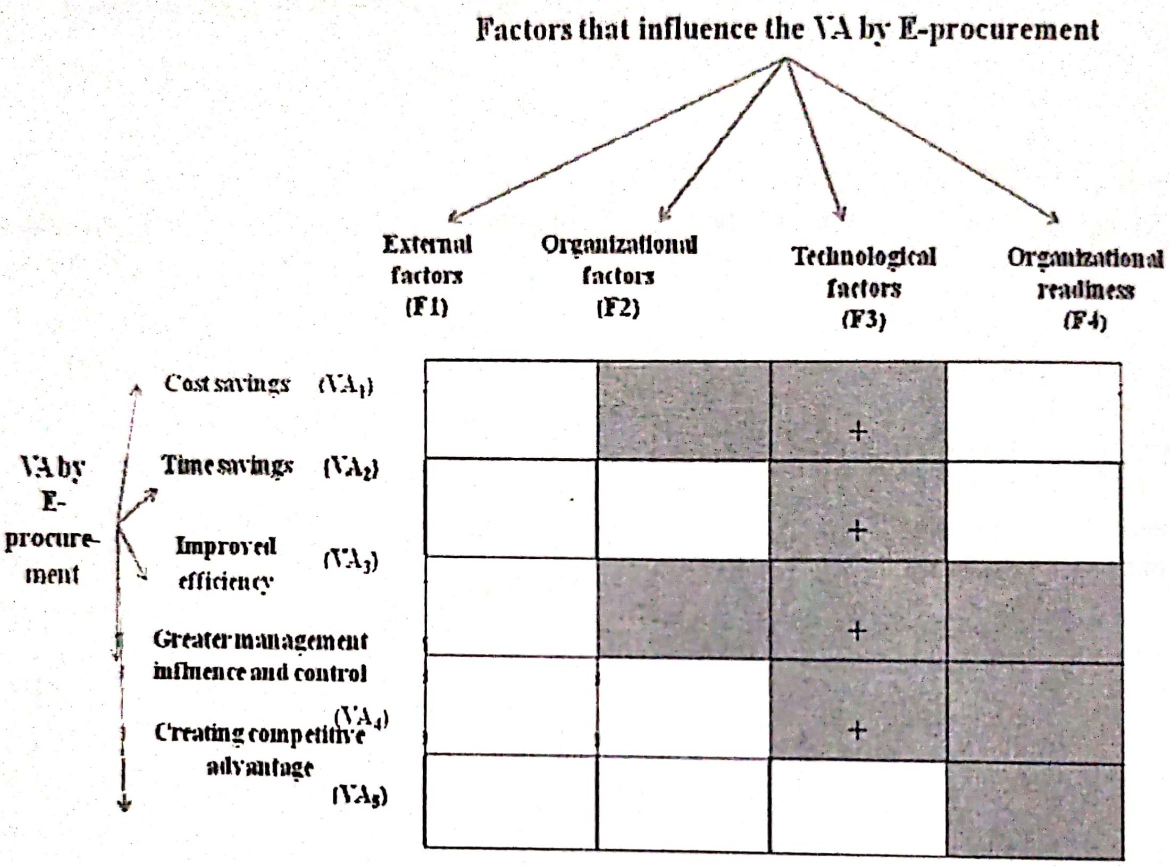

Factors that influence the VA by E-procurement
External factors (F1)
Organizational factors (F2)
Technological factors (F3)
Organizational readiness (F4)
VA by E-procure-ment
Cost savings (VA$_1$)
Time savings (VA$_2$)
Improved efficiency (VA$_3$)
Greater management influence and control (VA$_4$)
Creating competitive advantage (VA$_5$)
20 Hypothesis

Preliminary results

In figure 3 the empirical results are presented. The gray areas pinpoint that there is a relation of dependence between a particular factor and a particular value added (H0 is rejected at the 95% confidence level). The white areas show that there is a relation of independence between the factors and the values added.

These are only preliminary results because of the size of the sample we took (50 managers) and because we tested the operationalization of factors and values added. In testing the hypothesis (H0) that a particular factor is independent from a particular value added, we came up with a 5% confidence level.

Figure 3: The relations of dependence and independence between the factors affecting value added and the values added by E-procurement


Factors that influence the VA by E-procurement
External factors (F1)
Organizational factors (F2)
Technological factors (F3)
Organizational readiness (F4)
VA by E-procurement
Cost savings (VA$_1$)
Time savings (VA$_2$)
Improved efficiency (VA$_3$)
Greater management influence and control (VA$_4$)
Creating competitive advantage (VA$_5$)
+
+
+
+

Based on the obtained results it is interesting to see that the technological factors are very important factors which affect the first four values added by the E-procurement we took into consideration. Furthermore, the technological factors positively affect all four of the added values. This means that the higher the reliability and compatibility of the E-procurement with other IT systems, the more value added can be provided by the E-procurement.

Also, organizational readiness appears to be an important factor that can affect the last three values, added by E-procurement (improved efficiency of the purchasing process, greater management influence and control, creating competitive advantage). This means that if the organizations have the financial resources, a good implementation strategy of the E-procurement system and management support, the E-procurement can be implemented with success and can provide the mentioned value added.

We also obtained some unexplained relations of independence, like for example, between the external factors and all five of the added values mentioned.

Conclusions

This article is intended to draw the attention of managers on the tremendous potential of E-procurement in order to provide value, added to the organizations. Based on a literature review we summarized the main value, added by E-procurement.

Nowadays, organizations are currently at their early stages of E-procurement adoption and implementation. E-procurement can offer much value, added to the organizations but in the same time there are also factors that influence the implementation of E-procurement and its capacity to provide added value.

The implementation process can be a difficult task for managers, and therefore they have to answer the following questions before implementing E-procurement:

- What are the major added values of implementing E-procurement for an organization?
- What are the main factors that influence the value, added by the E-procurement?
- What are the main impacts of implementing E-procurement?

Only after answering these questions can managers take a decision regarding the implementation process of E-procurement.

In order to help managers we developed a conceptual model of the factors affecting the value added by E-procurement. We tested this conceptual model in 50 organizations from Maramures County using a questionnaire, and we presented the preliminary findings. In order to generalize the result we need to test the conceptual model in a larger number of organizations.

This model can be used by managers as a starting point in the process of adopting and implementing E-procurement in their organizations. Managers have to carefully analyze what the main factors are that affect the value added by the E-procurement adoption. They have to take into account all these factors and discover how to overcome the problems in the implementation process of E-procurement. Only after this analysis can they decide what strategy to adopt in the implementation process of E-procurement.

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Where n_{00} is the number of companies with F=0 and V=0 (number of companies which gave a NO response to the statements regarding the factor (F) and the value added (V).

We consider the following statistics:

$$\sum \frac{(observed-expected)^2}{expected} = \chi 2$$

which is called Pearson's $\chi 2$ statistics. Clearly $\chi 2$ is a measure of the departure of the observed n_{00} from their expectation $n_{0+}\, n_{+0}$ under hypothesis H (H0 : F and V are independent).

$$\chi 2 = \sum_{i=0}^{1}\sum_{j=0}^{1}\frac{\left(n_{ij}-\frac{n_{i+}n_{+j}}{k}\right)^2}{\frac{n_{i+}n_{+j}}{k}}\ \chi^2_1 \longrightarrow \text{(chi-square with 1 degree of freedom)}$$

This means that $\chi 2$ is approximately a χ_1^2 distribution.
Suppose that we determine the value of $\chi 2$. If $\chi 2 > 3.84$ (this value depends on the number of observations) then the hypothesis H0 is not true, this means that F and V are dependent. In the case that $\chi 2 < 3.84$ then the H0 is true and F and V are independent.

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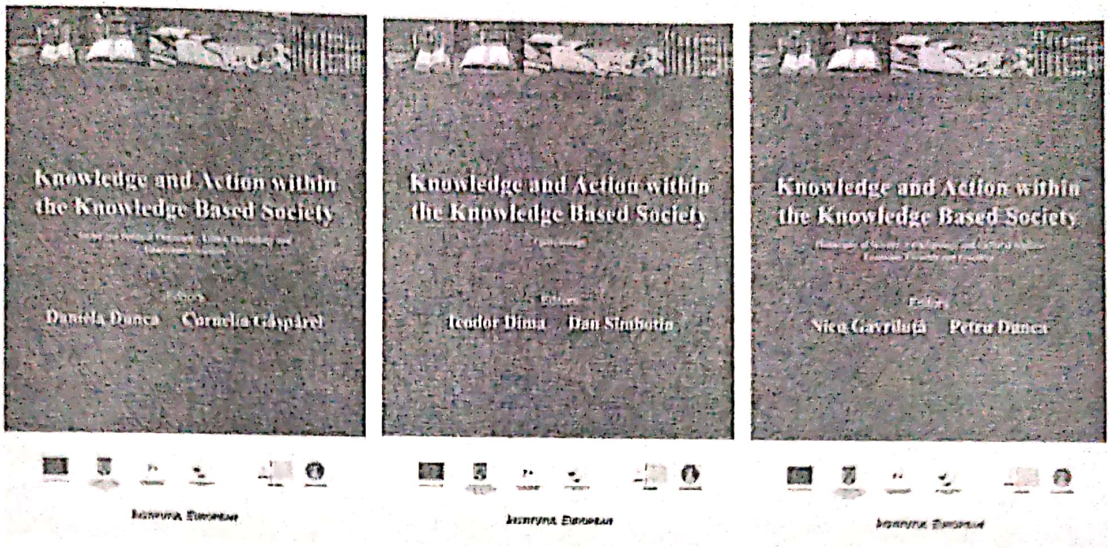

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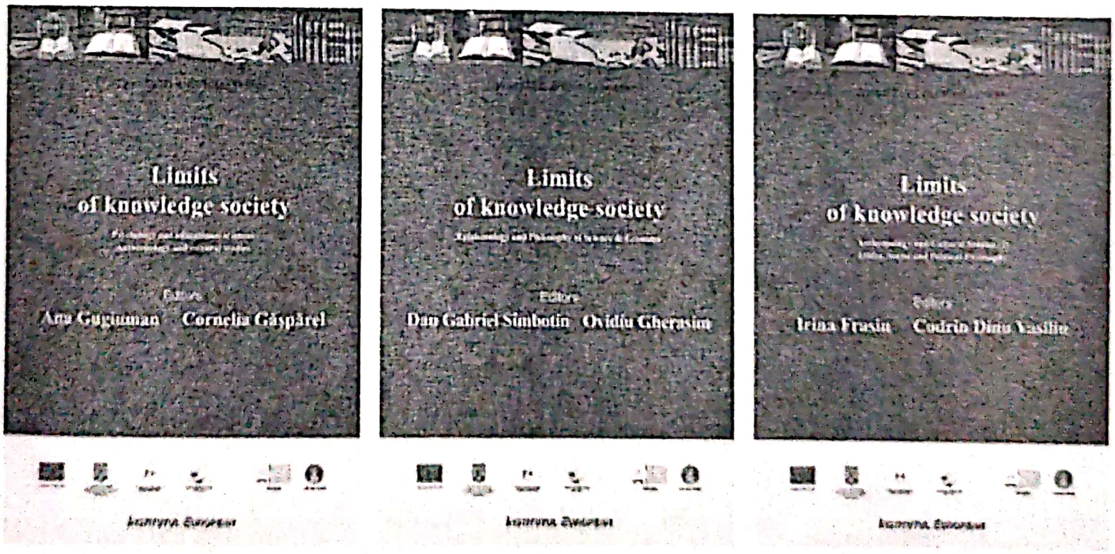

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II. BOLI INFECTO-CONTAGIOASE CU PRINCIPALĂ POARTĂ DE INTRARE: TUBUL DIGESTIV

Boala și agentul patogen	Rezistența agentului patogen în mediul extern	Căile de transmitere	Material infecțios	Poarta de intrare	Perioada de incubație (zile)	Ce produs recoltăm?	Cînd recoltăm?	Cum recoltăm?	Cît	Cum trimitem?	Ce examen cerem?	Interpretarea rezultatelor laboratorului
FEBRA TIFOIDĂ (Bacilul tific Eberth-Gafki)	In ape curgătoare 5—10 zile In ape stătătoare cîteva luni In lapte nefiert 30—35 zile In legume, fructe 5—10 zile Pe produse alimentare (unt, carne) 1—3 luni Pe lingerie, haine 1—2 săptămîni	Apă de băut Alimente Insecte (muște) Purtători de microbi	Materii fecale. Urină. Sînge.	Tubul digestiv.	*Mn. 7* *Mx. 21* *Medie 15*	Sînge proaspăt	Primele 3—5 zile	Puncție venoasă	8—10 cm³ în 10—50 cm³ bulion-bilă	F. urgent bine ambalat, să nu se ude dopul	Hemo-cultură	Pozitiv prin dezvoltarea bacilului tific
						Sînge coagulat (ser)	După 7—8 zile de la îmbolnăvire	Puncție venoasă sau din deget	1—2 cm³ ser	In eprubete	Sero-reacția Widal	Pozitiv prin aglutinare peste 1/100 (atenție la vaccinați)
						Materii fecale	După 2 săptămîni de la îmbolnăvire	Defecare în vase opărite (nu dezinfectate cu substanțe antiseptice)	Un fragment de mărimea unui degetar	In colectoare speciale, cu linguriță pt. recoltă	Culturi pt. bacili tifo-paratifici	Pozitiv prin dezvoltarea bacilului tific
						Urină	Idem	Urinare într-o sticlă sau eprubetă sterilă	20—50 cm³	In flacoane sau eprubete sterile	Idem	Idem
PARA-TIFOIDĂ A (Bacilul paratific A Brinn-Kaiser)	Idem	Idem + intoxicații alimentare	Idem + produse de la animale bolnave	Idem	*Mn. 2* *Mx. 14* *Medie 8*	Ca la febra tifoidă						
PARA-TIFOIDĂ B (Bacilul paratific B Schottmüller)	Idem	Idem	Idem	Idem	*Mn. 3* *Mx. 14* *Medie 5*	Ca la febra tifoidă						
DIZENTERIA BACILARĂ (Bacilul dizenteric Shiga-Kruse,	In pămînt, cîteva luni, putînd ierna sub zăpadă. Pe lingerie murdară cîteva săptămîni Pe pîine, legume și	Apă de băut Alimente	Materii	Idem	*Mn. 2* *Mx. 7*	Materii		Defecare în vase opărite	Un fragment	Foarte urgent	Culturi pt	Pozitiv prin

						Urina		eprubetă sterilă	20—50 cm³	sau eprubete sterile	Idem	Idem
PARA-TIFOIDA A (Bacilul paratific A Brinn-Kaiser)	Idem	Idem + intoxicații alimentare	Idem + produse de la animale bolnave	Idem	*Mn. 2* *Mx. 14* *Medie 8*	Ca la febra tifoidă						
PARA-TIFOIDA B (Bacilul paratific B Schottmüller)	Idem	Idem	Idem	Idem	*Mn. 3* *Mx. 14* *Medie 5*	Ca la febra tifoidă						
DIZENTERIA BACILARĂ (Bacilul dizenteric Shiga-Kruse, Hiss-Flexner, Semitz-Slutzer Sonne)	In pămînt, cîteva luni, putînd ierna sub zăpadă. Pe lingerie murdară cîteva săptămîni Pe pîine, legume și fructe, 1—2 săptămîni In produse lactate pînă la 9—10 zile In intestinul muștei de casă. 10—12 zile	Apă de băut Alimente Muște Purtători de microbi	Materii fecale	Idem	*Mn. 2* *Mx. 7* *Medie 3*	Materii fecale.	Primele zile	Defecare în vase opărite (nu dezinfectate cu substanțe antiseptice)	Un fragment de mărimea unui degetar	Foarte urgent sau însămînțări la patul bolnavului	Culturi pt. bacili dizenterici	Pozitiv prin dezvoltarea bacilului dizenteric
HOLERA (Vibrionul holeric Koch)	In fecale 2—3 zile Pe lingerie murdară 10—12 zile In pămînt, în straturi adînci, pînă la 2 luni In apă, pînă la 3 luni In lapte, brînză, 1—6 zile In unt, pînă la 30 zile Pe legume, fructe, pînă la 10—12 zile In cadavrele holericilor 3—4 săptămîni	Apă de băut Alimente Muște Lingerie Purtători de microbi	Materii fecale.	Idem	*Mn. cîteva ore* *Mx. 5* *Medie 2*	Vărsături	Prima zi	In vase sterile (borcane, cutii Petri)	10—20 cm³	Prin curier special sau deplasarea echipei laboratorului	Culturi pt. vibrioni holeric	Pozitiv prin dezvoltarea vibrionului holeric
						Materii fecale	Primele zile	Defecare în vase opărite (nu dezinfectate)	Un fragment de mărimea unui degetar	Idem	Idem	Idem
BRUCELOZA 1. Micrococcus melitensis Bruce (Febra de Malta) 2. Micrococcus abortus Bang (la vaci) 3. Micrococcus suis Traume (la porci)	In lapte între 20—60 zile In produse lactate acide, 10—20 zile In brînză 1—2 luni In apă, pămînt 2—3 luni Pe haine murdare cu urină, pînă la 14 zile	Aer, Praf, Pămînt, Apă, Alimente, Căpușe, Șobolani.	Sînge. Urină. Lapte. Carne.	Idem + căile respiratorii și pielea	*Mn. 7* *Mx. 31* *Medie 20*	Sînge proaspăt	Prima zi	Puncție venoasă	5 cm³ în medii speciale	Urgent bine ambalat	Culturi	Pozitiv prin dezvoltarea microbului
						Sînge coagulat (ser)	A doua săptămînă	Puncție venoasă sau din deget	1—2 cm³ ser	In eprubete	Seroreacție	Aglutinări specifice
						Urină	Primele zile	Urinarea în flacoane sterile	30—50 cm³	In vase sterile	Culturi	Pozitiv prin dezvoltarea microbului

I. TABELUL PRODUSELOR PENTRU RECOLTARI

PRODUSUL	MODUL RECOLTARII		EXAMENUL DE LABORATOR	Cînd poate da laboratorul rezultatul	REZULTAT	DIAGNOSTIC	OBSERVAȚIUNI
SINGE	*Necoagulat*	*Din venă* (în medii de cultură sterile)	Hemocultură	După 2—7 zile	Bacil tific sau paratific A, B. Bacil cărbunos, stafilococ etc.	Febră tifoidă sau paratifoidă A, B, Antrax, Septicemie stafilococică etc.	
		Din deget (cu pipete speciale)	Numărătoarea globulelor	In aceeași zi	Leucocitoză (peste 8 000 gl. albe) Leucopenie (sub 5 000 gl. albe)	Infecții acute, supurații. Febră tifoidă, paludism, anemie.	
	Coagulat	Utilizat numai *serul*	Seroreacția Widal	A doua zi	Aglutinare peste 1/100 bac. tific, paratific, A, B.	Febră tifoidă, paratifoidă, A, B.	Persoanele vaccinate au aglutinări 1/100—1/200
			Seroreacția Weil-Felix	A doua zi	Aglutinare peste 1/100 proteus X 19	Tifos exantematic	Idem
			R. Wassermann R. Citochol, Meinicke, Kahn etc.	A doua zi	Negativ, dubios, slab pozitiv, pozitiv, intens pozitiv.	Sifilis leziunea primară mai veche de 21 de zile (timpul perioadei sero-negative), contactul infectant, mai vechi de 42 zile]	Reacțiile de floculare (Citochol, etc) sînt mai *sensibile* însă mai puțin *specifice*
	Pe lamă	*Frotiuri* (nefixate)	Formula leucocitară	In aceeași zi	Polinucleoză sau limfocitoză	Infecții acute sau cronice	
		Picătură groasă	Examen parazitologic și bacteriologic	In aceeași zi	Plasmodium malariae Spirocheta Obermeier	Malarie Febră recurentă	
			R. Kudicke-Steuer	In aceeași zi	Pozitiv	Tifos exantematic	
FECALE	Recoltare în mod steril	Colectoare speciale sterile	Examen bacteriologic direct și culturi	In aceeași zi Culturi după 4—5 zile	Bacili tifici sau paratifici A, B. Bacili dizenterici, Bacili Koch, Bacili cărbunoși, Vibrioni holerici.	Febră tifoidă sau paratifoidă A, B. Dizenterie. Tuberculoză intestinală sau pulmonară, (pozitivitatea prin înghițirea sputei), Antrax (formă intestinală) Holeră	Pentru dizenterie transportul fecalelor la laborator, *foarte urgent*. Pentru holeră *curier special.*
	Recoltare nesterilă	Colectoare speciale sau improvizate	Examen parazitologic	In aceeași zi	Ouă de paraziți	Helmintiaze	
URINA	Recoltare în mod steril (cu sau fără sondaj)	Colectare direct în vase sterile (eprubete, flacoane)	Examen bacteriologic direct și culturi	In aceeași zi Culturi după 4—5 zile	Bacili Koch, Colibacili, Bacili tifici, paratifici A, B.	Tuberculoză renală, Colibaciloză. Febră tifoidă, paratifoidă A, B.	
			Inoculare la cobai	După 30—40 de zile	Leziuni tuberculoase la cobai (la locul de inoculare, în organe sau generalizate).	Tuberculoză renală	Se impune cateterism ureteral pt. precizarea rinichiului bolnav.
SPUTA	Recoltarea direct în vase sterile	Borcane, cutii Petri sterile	Examen bacteriologic direct și culturi	In aceeași zi Culturi după 2—4 zile	Bacili Koch, Pneumococi, Bacili cărbunoși, Bacilii ciumei.	Tuberculoză pulmonară. Pneumonie. Antrax (pulmonar). Ciumă (formă pulmonară).	
EXSUDAT [illegible]	Mucozități, false membrane)	Euprubete cu tampon sterile	Examen bacteriologic direct și culturi	In aceeași zi Culturi a doua zi	Bacili difterici, Asociație fuzospirilară, Streptococi-hemolitici	Difterie. Angină Vincent. Scarlatina.	

SECREȚII (oculare, nazale, uretrale, vaginale)	Frotiuri	Pe lame	Examen bacteriologic	În aceeași zi	Gonococi, Bacili difterici, Meningococi, Bacilii leprei.	Blenoragie. Difterie. Meningită cerebro-spinală. Lepră.	Gonococul, meningococul, *puțin rezistenți*, necesită pt. culturi transport rapid
	Însămînțări	Pe medii speciale	Culturi	După 2—4 zile			
SEROZITĂȚI din șancre, leziuni specifice (eroziuni, papule)	Frotiuri (*nefixate*)	Pe lame	Examen bacteriologic (colorație Gram-Nicolle și Tribondeau-Fontana)	În aceeași zi	Bacili Ducrey Spirocheta pallida Schaudinn	Șancru simplu (contact infectant recent) mixt sau sifilitic (contact infectant mai vechi de 21 de zile, perioada de incubație)	Pentru examen ultramicroscopic se va trimite bolnavul la laborator
LICHIDE DE PUNCȚIE (cefalorahidian, pleural, articular, ascitic etc.)	*Puncție* (lombară, pleurală, articulară, abdominală)	In eprubete sterile	Examen bacteriologic direct și culturi	În aceeași zi Culturi după 2—4 zile	Meningococi, Pneumococi, Gonococi, Streptococi, etc.	Meningite, pleurezii, artrite, ascite etc. microbiene	
			R. Nonne-Appelt, R. Pandy, R. Rivalta	În aceeași zi	Pozitive	Meningite, sifilis, ex-transsudate.	
PUROI	Puncție	In eprubete	Examen bacteriologic direct și culturi	În aceeași zi Culturi după 2—4 zile	Stafilococi, Streptococi, Bacili cărbunoși, Bacili tetanic, Bacili perfringens, Bacilii leprei, Bacilii ciumei.	Infecții stafilococice, streptococice, antrax, tetanos, gangrenă gazoasă, lepră, ciumă (bubonică)	Pentru ciumă se deplasează echipă specială de la laborator
	Aspirație	Pipete Pasteur					
	Cu ansa	Pe lame					
VĂRSĂTURI	—	In vase sterile	Culturi	După 2 zile	Bacili Aertrycke, Gärtner Vibrioni holerici	Toxiinfecții alimentare. Holeră	

III. BOLI INFECTO-CONTAGIOASE CU PRINCIPALA POARTĂ DE INTRARE: CĂILE RESPIRATORII

Boala și agentul patogen	Rezistența agentului patogen în mediul extern	Căile de transmitere	Material infecțios	Poarta de intrare	Perioada de incubație (zile)	Ce produs recoltăm?	Cînd recoltăm?	Cum recoltăm?	Cît recoltăm?	Cum trimitem?	Ce examen cerem?	Interpretarea rezultatelor laboratorului
DIFTERIA (Bacilul difteric Löffler)	În spută uscată se păstrează, la întuneric, virulent pînă la 3 luni. La soare, bacilul moare în cîteva ore. În lapte, apă, trăiește pînă la 3 săptămîni	Prin aer (picăturile Pflügge) și prin praf, alimente. Obiecte uzuale Purtători de microbi.	Mucozități din gură, nas. False membrane.	Căile respiratorii Tubul digestiv	*Mn. 2* *Mx. 14* *Medie 5*	Mucozități din gît sau false membrane	Primele zile	Tampon de vată (preferință steril)	Exsudat suficient (nu salivă) sau fragment falsă membrană	Colector special sau tampon improvizat într-un flacon, pahar etc.	Examen bacteriologic direct și culturi	Pozitiv prin prezența sau dezvoltarea bacilului difteric
SCARLATINA (Virus filtrant? Streptococul hemolitic se găsește în toate cazurile)	Streptocolul hemolitic, în stare uscată, își păstrează virulența cel puțin ½ an	Prin aer alimente. Purtători de microbi.	Mucozități din gură, nas. Descuamații Sînge	Idem	*Mn. 1* *Mx. 7* *Medie 7*	Idem	Idem	Idem	Exsudat suficient (nu salivă)	Idem	Culturi	Pozitiv prin dezvoltarea streptococului hemolitic
MENINGITA Cerebro-spinală (Meningococ Weichselbaum)	Moare repede la lumină, la aer sau la uscăciune	Prin aer, lingerie. Purtători de microbi	Mucozități din gură sau nas Sînge?	Căile respiratorii	*Mn.* cîteva ore *Mx. 7* *Medie 2*	Lichid cefalo-rahidian	Idem	Puncție rahidiană	5—10 cm³	Eprubetă sterilă, transport rapid, ferit de răceală		Pozitiv prin prezența sau dezvoltarea menigococului
						Mucozități din nas (purtători)	Idem	Tampon de vată steril	Mucozități suficiente	Colector special	Idem	Idem
TUBERCULOZA (Bacilul tuberculozei Koch)	În apă, în pămînt, sputele cu bacili păstrează microbii virulenți pînă la 1 an În aer, la întuneric 2 luni. La lumina solară directă cîteva ore, la lumina solară indirectă cîteva zile	Aer (picăturile Pflügge) Praf. Alimente (carne, lapte, etc) provenite de la animale bolnave.	Produse de la bolnavi (spută, urină, etc) sau de la animalele bolnave (carne, lapte, etc.)	Căile respiratorii Tubul digestiv Pielea	Variabil	Spută	Dimineața prima expectorație (nu salivă)	În vase sterile sau opărite (borcane, cutii Petri)	Cantitatea expectorată suficientă pt. examen	În vasele în care s-a făcut recolta	Examen bacteriologic direct și prin omogenizare	Pozitiv prin prezența bacilului Koch
						Urină	Dimineața prima urină	Direct în flacoane sau eprubete sterile	30—50 cm³	Idem	Examen bacteriologic direct, culturi, inoclări la cobai	Pozitiv prin prezența bacilului Koch, direct, culturi, inoculare
						Fecale	Dimineața primul scaun (copiii înghit sputa)	Defecare în vase opărite	Fragment de mărimea unui degetar	Colectoare speciale cu linguriță	Examen bacteriologic și procedee speciale	Pozitiv prin prezența bacilului Koch
						Lichid cefalo-rahidian	În cazuri de meningită tuber-	Puncție rahidiană eprubete sterile	5—10 cm³	După 24 de ore de la recoltare (depune voal de	Examen bacteriologic citologic și chimic	Pozitiv prin prezența bacilului Koch. Citologic leucocitoză Chimic

IV. BOLI INFECTO-CONTAGIOASE CU PRINCIPALA POARTĂ DE INTRARE: MUCOASELE

SIFILISUL (Spirocheta Schaudinn)	Rezistență foarte redusă la căldură, frig, uscăciune. Moare la 6—7 ore după părăsirea corpului	Contact sexual. Inoculări accidentale (vaccinări cu vaccinostil comun nedezinfectat). Experiențe. Alimente mestecate în gură și date copiilor.	Serozități din șancre Leziuni sifilitice (ulcere, papule) Sînge	Mucoasele pielea	*Medie 21*	Serozitate șancru	Primele 14 zile de la apariția leziunii	Frotiu pe lame (24 ore leziunea netratată necauterizată)	Cantitatea necesară pt. 2—3 lame	Lame uscate prin evaporare (nefixate prin căldură)	Examen bacteriologic direct (col. Gram și Tribondeau Fontana)	Șancru tare prin prezența spirochetei Schaudinn sau șancru mixt prin prezența și a bacilului Ducrey
						Sînge (ser)	După 21 de zile de la apariția leziunii	Puncție venoasă	3—5 cm³ ser	In eprubete	R. de floculare și reacția Wassermann	Negativ, dubios (repetare), slab pozitiv, pozitiv, intens pozitiv
						Lichid cefalo-rahidian	In cazuri de sifilis nervos	Puncție rahidiană	2—3 cm³	In eprubete	R. coloidale R. Wasser. Examen bacteriologic R. Nonne-Appelt, Pandy	Idem Citologic, creșterea numărului elementelor și albuminei
BLENORAGIA (Gonococul Neisser)	Puroiul gonococic, la aer, pierde virulența și germenii rămîn vii 5—72 ore dacă puroiul nu se usucă In apă, 2—14 ore In urină, bureți umezi 24 ore	Contact sexual. Lingerie.	Puroi, secreții (uretrale, conjunctivale, etc.) Urini.	Mucoasele (uretrală, vaginală, anală, conjuctivală).	*Medie 3*	Secreție uretrală	Dimineața înainte de urinare	Frotiuri pe lame	Nu prea puțin nu prea mult	Lame	Examen bacteriologic direct	Pozitiv prin prezența gonococului
						Secreție vaginală și col uterin	Dimineața. Cazuri cronice primele zile după epoca menstruală	Idem	Idem	Idem	Idem	Idem

V. BOLI INFECTO-CONTAGIOASE CU PRINCIPALA POARTĂ DE INTRARE: PIELEA

Boala și agentul patogen	Rezistența agentului patogen în mediul extern	Căile de transmitere	Material infecțios	Poarta de intrare	Perioada de incubație (zile)	Ce produs recoltăm?	Cînd recoltăm?	Cum recoltăm?	Cît recoltăm?	Cum trimitem?	Ce examen cerem?	Interpretarea rezultatelor laboratorului
TIFOSUL EXANTEMATIC (Rickettsia Prowazecki)	In organismul păduchelui, care rămîne pe lingeria sau hainele bolnavului, trăiește pînă la 4 săptămîni	Numai prin păduchi (infecțioși la 5—7 zile după ințepătura infectantă)	Singe	Pielea	*Mn. 5* *Mx. 20* *Medie 11*	Singe coagulat (ser)	Din a 5-a zi	Prin puncție venoasă sau din deget	1—2 cm³ ser	In eprubete	Seroreacția Weil-Felix	Pozitiv prin aglutinare peste 1/100 (atenție la vaccinați)
						Singe pe lamă (picătură groasă)	Idem	Din deget	2—3 picături	Pe lame nefixate prin căldură	Reacția Kudicke Steuer	Pozitiv sau negativ
FEBRA RECURENTA (Spirocheta Obermeier)	In organismul păduchelui, infectat, căpușei, se păstrează timp îndelungat	Prin păduchi, căpușe	Idem	Idem	*Mn. 3* *Mx. 14* *Medie 8*	Singe pe lamă (frotiu sau picătură groasă)	Idem	Idem	Frotiu sau 2—3 picături	Idem	Examen bacteriologic direct	Pozitiv prin prezența spirochetei Obermeier
MALARIA (Plasodium malariae „ vivax „ falciparum)	In organismul țînțarului Anopheles	Numai prin țînțar (infecțios după 1—7 săpt. de la ințepătura infectantă)	Idem	Idem	*Mn. 5* *Mx. 15* *Medie 10*	Idem	In plin acces de febră	Idem	Idem	Idem	Idem	Pozitiv prin prezența hematozoarului
ANTRAXUL (Bacilul cărbunelui Davaine)	Sporii se păstrează, în pămînt, zeci de ani. In pielea și lîna animalelor bolnave, se păstrează ani de zile	Prin aer, praf, pămînt, alimente, haine (cojoace) Produse animale (piei, păr, coarne) Muște	Singe Materii fecale	Pielea Căile respiratorii Tubul digestiv	*Mn* cîteva ore *Mx. 8* *Medie 3*	a. *Forma cutanată* conținut vezicule din jurul ulcerației	Din prima zi	Puncționarea veziculelor	Cantiatea necesară pt. frotiuri	Lame cu frotiuri fixate prin căldură	Examen bacteriologic direct	Pozitiv prin prezența bacilului cărbunelui
						b. *Forma pulmonară* Spută	Idem	In vase sterile (borcane, cutii Petri)	Cantitatea necesară pt. culturi	Flacon steril	Culturi	Pozitiv prin dezvoltarea bacilului cărbunelui
						c. *Forma*	Idem	Defecare în vase opă-	Fragment de mări-	Colectoare speciale pt.	Idem	Idem

TULAREMIA (Bacilul tularense Mc Coy)	In piei uscate, ale rozătoarelor, pînă la 2 luni. In apă, pămînt, 3 luni. In furaje, grăunţe, infectate cu excrementele rozătoarelor bolnave, cîteva săptămîni	Purici, căpuşe, iepuri de casă, şobolani	Sînge	Pielea Tubul digestiv	*Mn. 1* *Mx. 14* *Medie 3*	Sînge proaspăt	I—VIII zi	Puncţie venoasă	8—10 cm³ în 100 cm³ mediu special	Urgent, bine ambalat	Culturi	Pozitiv prin dezvoltarea bacilului tularense
						Sînge coagulat (ser)	XIV—XV zi	Idem sau din deget	1—2 cm³ ser	In eprubete	Seroreacţie	Aglutinare specifică
CIUMA (Bacilul ciumei Yersin)	In puroi şi în umezeală trăieşte cîteva luni Pe haine, lingerie, o lună. In pureci, un an. In cadavre, 5 luni. In pămînt, la temperatură joasă 1—1½ an	Aer, praf. Alimente Pureci Rozătoare	Fecale Urină Sînge	Pielea Căile respiratorii Tubul digestiv	*Mn* cîteva ore *Mx. 14* *Medie 4*	a. *Forma bubonică* Suc ganglionar	Din prima zi	Prin puncţie ganglionară	Frotiuri pe lame (fixate) Insămînţări pe loc	Prin curier special sau deplasarea echipei laboratorului	Examen bacteriologic direct şi prin culturi	Pozitiv prin prezenţa sau dezvoltarea bacilului ciumei
						b. *Forma pulmonară* Spută	Idem	In vase sterile (borcane, cutii Petri)	Cantiate suficientă pt. frotiuri şi culturi	Idem	Idem	Idem

- Revoluția în gîndirea biologică a produs-o Darwin care argumentînd cu probe evoluția organismelor vii, prin teoria biologică de bază a științei de [illegible] stat la baza, dînd lovitură misticismului și religiei în general.

Darwin considera ereditatea ca fenomenul asemănării descendenților cu părinții mai mult sau mai puțin apropiată. El arată că între ascendenți și descendenți nu există o identitate absolută și arată că eredității îi este specifică atît conservatorismul cît și variabilitatea. Referindu-se la problema transmiterii prin ereditate la descendenți a caracterelor și însușirilor dobîndite Darwin spune în Tratatul: „de aceea cel mai just deci a privi această problemă ar fi să considerăm transmiterea ereditară a oricărui caracter drept regulă, iar netransmiterea ereditară drept anomalie"!

- 1868 Darwin elaborează teoria pangenezei – prin care afirmă că ereditatea este localizată în niște particule materiale din numite gemule, care migrează din diferite părți ale corpului spre celulele sexuale, unde se concentrează și se transmit prin reproducere noului organism determinîndu-i caracterele și însușirile.

- Darwin admite [illegible] creată. Teoria de la 13-26.

– TEORIILE CORPUSCULARE ALE EREDITĂȚII –